

STATE OF NEW HAMPSHIRE

MERRIMACK, SS.

SUPERIOR COURT

DOCKET NO. 217-2012-cv-212

* * * * *
CITY OF DOVER, TOWN OF EXETER, :
TOWN OF NEWMARKET, CITY OF :
PORTSMOUTH, and CITY OF ROCHESTER, :
:
Petitioners, :
v. :
:
STATE OF NEW HAMPSHIRE and NEW :
HAMPSHIRE DEPARTMENT OF :
ENVIRONMENTAL SERVICES, :
:
Defendants. :
* * * * *

DEPOSITION OF FREDERICK T. SHORT

This deposition was taken at the offices
of Sheehan Phinney Bass + Green, PA, 1000
Elm Street, Manchester, NH 03101, on
Monday, May 14, 2012, by and before Deanna
Dean, RDR, CRR, New Hampshire License No.
87, commencing at 12:59 p.m.

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STIPULATIONS

It is agreed that the deposition shall be taken in the first instance in stenotype and when transcribed may be used for all purposes for which depositions are competent under New Hampshire practice.

Notice, filing, caption and all other formalities are waived. All objections except as to form are reserved and may be taken in court at time of trial.

It is further agreed that if the deposition is not signed within thirty (30) days after submission to counsel, the signature of the deponent is waived.

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P R O C E E D I N G S

FREDERICK T. SHORT,

having been first duly sworn according to law,

was deposed and testified as follows:

EXAMINATION

BY MR. HALL:

Q. Good afternoon, Dr. Short. How are you doing?

A. Good.

Q. Good.

My name is John Hall and I am an attorney for the petitioners, and I'm going to be asking you some questions today regarding the Great Bay issues, particularly related to eelgrass, a topic that I would take you are intimately familiar with?

A. (Nodding head)

Yes. Yes.

Q. Yes.

Let me just start with a few initial points. If at any time I ask a question and you don't understand what I'm asking or you think it's confusing, please stop me and we'll, you know,

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1 rephrase the question, or I'll try to clarify how
2 things are.

3 A. Mm-hmm.

4 Q. If you get tired at any point and you
5 need some water or something else -- you need a
6 break -- you're the one answering the questions.
7 It's more difficult on your end than it is to ask the
8 questions. So please don't be bashful about asking
9 for a break. This isn't a forced march.

10 A. Okay. Great.

11 Q. And I guess the only --

12 MR. HALL: Marty, in terms of where we
13 are, I guess we -- I would say we're reserving
14 all objections except as to form, the
15 typical -- you know, we're not quite sure
16 exactly what all will be submitted or not with
17 the court.

18 MS. VAN OOT: Yeah. It's the usual
19 stipulations, which is reservation of all
20 objections until the time of trial, except as
21 to the form of the question. But that would
22 be modified by the court's protective order.
23 So I will object as necessary on the

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1 protective order. And it might be a good idea
2 to mark that before we start.

3 MR. HALL: Okay. And in terms of any
4 objections on the protective order, since I
5 was not the attorney that was there at the
6 hearing on the protective order but Tupper
7 Kinder was certainly among counsel that was
8 there, Tupper may be the one that provides the
9 reply on that for the record as issues come
10 up.

11 MR. KINDER: We have a clean copy of
12 the protective order.

13 *BY MR. HALL:*

14 Q. Dr. Short, just another question: Have
15 you ever been deposed before?

16 A. No.

17 Q. Okay. So this is the first time?

18 A. This is the first time.

19 Q. Well, we will try to make this as
20 pleasant an experience if possible, if it's possible.

21 A. That would be great.

22 Q. Can you please state your name for the
23 record.

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1 A. Frederick Tilton Short.

2 Q. And can you let us know what your
3 current place of employment is.

4 A. I'm employed at the University of New
5 Hampshire.

6 Q. And for how many years have you been
7 employed at the University of New Hampshire?

8 A. 29-plus years.

9 Q. 29-plus years.

10 Can you please tell me what your
11 educational background is. From college onward, of
12 course.

13 A. Okay. I went to college at Plymouth
14 State here in New Hampshire, majored in mathematics.
15 I did graduate work at -- in Rhode Island at the
16 Graduate School of Oceanography, University of Rhode
17 Island, and did my PhD at the University of Alaska.

18 Q. And before coming to the University of
19 New Hampshire, where were you working?

20 A. I was -- immediately before, I was at
21 Harbor Branch Institution in Fort Pierce, Florida.
22 That was a postdoc.

23 Q. Postdoc.

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1 And what would you consider your
2 specialty is in terms of your education?

3 A. Seagrass ecology, or almost everything
4 to do with seagrass.

5 Q. Okay. Can you tell me whether or not
6 you are a member of CLF, the Conservation Law
7 Foundation?

8 A. Like a dues-paying member? Or --

9 Q. Well, a member -- yes, a dues-paying
10 member.

11 A. No, I'm not.

12 Q. Do you work with them periodically to
13 provide them advice or insight on eelgrass issues?

14 A. Yes. Mm-hmm.

15 Q. Okay. And with regard to Great Bay,
16 have you provided advice to them on eelgrass and
17 nitrogen issues?

18 A. Yeah.

19 Q. I'm going to ask you the same question
20 with regard to a couple other organizations, too.

21 With regards to EPA, have you provided
22 them advice on the nitrogen criteria needed to
23 protect eelgrass and the need to regulate based on

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1 transparency?

2 A. I don't know. I basically --

3 MS. VAN OOT: Do you need the question
4 repeated?

5 A. Depends how specific those details are.
6 You know, they -- I have provided them information on
7 eelgrass, aspects of eelgrass ecology, and my
8 knowledge of Great Bay.

9 Q. Okay.

10 A. The Great Bay Estuary.

11 Q. With regard to DES, New Hampshire DES --

12 A. The same.

13 Q. -- the same question.

14 A. The same in all cases.

15 Q. Okay. Were you a member of the
16 Technical Advisory Committee that was formed to
17 address water quality criteria development and other
18 issues for Great Bay?

19 A. Yes.

20 Q. Do you recall what years you were a
21 member of that committee, or were you just a member
22 of it throughout its duration?

23 A. I think throughout its duration.

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1 Q. Okay. Yeah, I think those years, as I
2 recall -- though I'm not testifying -- I believe
3 were -- 2005 to 2008, I think, is the time frame when
4 that TAC was --

5 A. Well, yeah. It still exists.

6 Q. Oh, it still exists?

7 A. Yes.

8 Q. Okay.

9 A. It's actually combined with another
10 group from Estuarine Research Reserve.

11 Q. Regarding the State of the Estuary
12 reports, did you provide input on those reports?

13 A. Yes.

14 Q. Can you please describe the input that
15 you provided.

16 A. Maps of eelgrass distribution annually.

17 Q. Anything else other than maps?

18 A. Some data relating to the maps.

19 Q. Okay. And could you just tell me what
20 kind of data that might have been?

21 A. Eelgrass. You know, biomass. Cover
22 estimates.

23 Q. Okay. Did you receive any federal grant

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1 monies to do research on eelgrass issues for
2 Great Bay?

3 A. Over what time period?

4 Q. Let's go --

5 A. Are we going to go over the whole 30
6 years?

7 Q. Oh, no. That would be too complicated.
8 Let's -- actually, I wasn't asking for the individual
9 projects that you may have received.

10 A. Oh.

11 Q. Just, in the past 20 years, have you
12 received federal funding to do eelgrass research on
13 Great Bay?

14 A. Yes.

15 Q. Give me an idea of what kind of projects
16 that might have been related to.

17 A. I had a project for the Great Bay
18 National Estuarine Reserve program, looking at
19 developing a baseline assessment of eelgrass in
20 Great Bay, using two types of monitoring: one,
21 Seagrass Net monitoring, which is a program I run;
22 and another which is monitoring the -- that they
23 wanted to -- wanted to use or to think about using.

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1 Q. Okay. With regard to the eelgrass
2 mapping of Great Bay, I understand you've been
3 involved in that for quite some time?

4 A. Since I arrived in '84.

5 Q. Since 1984?

6 A. Yeah.

7 Q. Okay. So when I'm looking at an
8 eelgrass monitoring report and it talks about being
9 done by the Jackson Lab, that would have been your
10 work?

11 A. That would have been my work, yes.

12 Q. Okay. And I presume whatever research
13 associates or assistants that you required --

14 A. Mm-hmm. Yeah.

15 Q. -- for helping out on that?

16 A. Students and technicians.

17 Q. Gotcha.

18 When you conducted these eelgrass
19 mapping studies, were these studies designed to
20 address the causes for changing eelgrass populations
21 in the bay?

22 A. No. They were just to give an annual
23 assessment of how eelgrass was doing.

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1 Q. Were you involved in the development of
2 the 2009 numeric nutrient criteria for Great Bay?

3 A. As part of the Technical Advisory
4 Committee.

5 Q. So that would be yes --

6 A. Yes.

7 Q. -- as part of TAC?

8 A. Yes.

9 Q. Okay. I'm going to ask you a couple
10 questions as to where you would hold yourself out as
11 an expert to the regulatory agencies or to others
12 just generally.

13 Start out with the easy one: Do you
14 consider yourself an expert on eelgrass ecology?

15 A. Yes.

16 Q. Okay. Do you consider yourself an
17 expert on transparency analysis?

18 A. To some extent. Well, having -- I would
19 say only having to do with how it affects eelgrass.

20 Q. Okay. Do you consider yourself an
21 expert on macroalgae?

22 A. No.

23 MS. VAN OOT: What was the word?

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1 MR. HALL: "Macroalgae."

2 M-a-c-r-o-a-l-g-a-e.

3 Q. Did I spell that right?

4 A. Also "seaweed."

5 MS. VAN OOT: Thank you.

6 Q. Do you consider yourself an expert on
7 algal dynamics?

8 A. No.

9 Q. Do you consider yourself an expert on
10 nutrient transport and dynamics in estuarine systems?

11 A. Yes.

12 Q. Okay. Can you explain how you consider
13 yourself an expert on nutrient dynamics?

14 A. I have a number of papers on it. I did
15 my PhD dissertation on nitrogen cycling and eelgrass
16 beds.

17 Q. Oh. Related to eelgrass?

18 A. Related to eelgrass.

19 Q. Okay. Yeah, I was asking -- the
20 question related to transport and -- so do you
21 consider yourself as an expert on nitrogen transport
22 through estuaries?

23 A. Can you be more specific?

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1 Q. Well, nitrogen loads come into tidal
2 rivers; hydraulically mixed within various sections
3 of a bay; converted to different forms; the rates at
4 which those forms convert. The freight and transport
5 of the nitrogen itself in the system.

6 A. Well, I did -- a lot of my PhD work was
7 nitrogen biogeochemistry. I've done a lot of
8 hydrodynamic modeling, having to do with current
9 movements and current flows and transport of
10 materials. I wouldn't necessarily say I'm an expert
11 on all of it, but I have a -- I have two degrees in
12 oceanography, which is pretty much dealing with those
13 issues.

14 Q. Okay. Did you conduct any nutrient
15 transport modeling or hydrodynamic modeling for Great
16 Bay?

17 A. Yes.

18 Q. During what time period?

19 A. Probably the mid-'90s.

20 Q. Who was that work conducted for?

21 A. I was working with a graduate student.

22 Q. But it wasn't --

23 A. It wasn't funded.

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1 Q. Oh, it wasn't funded?

2 A. No.

3 Q. Okay. So were the results of that
4 research provided to any of the federal or state
5 agencies?

6 A. There is a second program which was
7 funded by NOAA, which looked at ecosystem modeling,
8 not hydrodynamics.

9 Q. Not hydrodynamics. All right.

10 Okay. With regard to studies of Great
11 Bay to date, I'm going to just ask you some general
12 questions and then we'll get down to more some
13 specifics of the types of studies that you've
14 completed.

15 A. Mm-hmm.

16 Q. Did you ever do transparency monitoring
17 and modeling for Great Bay or the tidal rivers?

18 A. No.

19 Q. What about algal modeling or monitoring
20 for Great Bay or the tidal rivers?

21 A. No.

22 Q. Okay. Same question for turbidity in --
23 did you do turbidity monitoring and modeling for

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1 Great Bay and the tidal rivers?

2 A. Both.

3 Q. Well, maybe if you can --

4 A. No to both.

5 Q. Well, no to both?

6 A. No. Not --

7 Q. Oh.

8 A. No to the two together.

9 Q. Could you -- and I should stop asking
10 you compound questions.

11 A. That's right.

12 MS. VAN OOT: Yes.

13 Q. Well, I'm trying to save us time. I'm
14 moving through things maybe a tad bit more quickly
15 than should be done.

16 Can you please explain -- let's break
17 it down into two pieces.

18 Did you do turbidity modeling for Great
19 Bay or the tidal rivers?

20 A. No.

21 Q. No on the modeling.

22 And so then you did turbidity
23 monitoring?

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1 A. Monitoring, yes.

2 Q. Okay. For Great Bay.

3 Can you please tell me where you did
4 turbidity monitoring either within Great Bay or any
5 of the tidal rivers?

6 A. As part of the long-term monitoring
7 program that I ran for the State of New Hampshire, I
8 put out sediment elevation tables, sediment -- which
9 are permanent sites in the bay that measure how much
10 sediment is eroding or being deposited, and I
11 operated those for about 12 years. And at various
12 times I've had students that have done measurements
13 of sediment accumulation independent of that, in
14 marshes, mostly.

15 Q. Let's switch to the water column, then.

16 A. Okay.

17 Q. In terms of the turbidity level in the
18 water column, did you do any -- you did no modeling
19 of that?

20 A. I did neither one, no.

21 Q. On neither?

22 A. Yeah.

23 Q. So neither monitoring nor modeling on

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1 the water column turbidity?

2 A. Right.

3 Q. Okay. Same question: monitoring or
4 modeling of Great Bay and the tidal rivers with
5 regard to color?

6 A. No.

7 Q. No. Okay.

8 Did you ever do any water quality
9 modeling on how point or nonpoint source or nutrient
10 loads impact Great Bay and the tidal river -- and
11 the tidal rivers?

12 A. Repeat it, please.

13 Q. Yeah, I'm sorry. Let me do it again.

14 Did you ever do any water quality
15 modeling of how point and nonpoint source nutrient
16 loads impact Great Bay or the tidal rivers?

17 A. Yes.

18 Q. Can you please explain what the scope of
19 that was?

20 A. As part of a project funded by USDA, we
21 looked at the potential for eelgrass restoration in
22 the Bellamy River, and in that process, the
23 monitoring that went with that process, we looked at

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1 sediment dynamics.

2 Q. You looked at sediment dynamics?

3 A. Yes.

4 Q. Okay.

5 A. And measured light levels.

6 Q. Okay. And -- okay. Let me refine the
7 question a little bit.

8 Did you ever do any water quality
9 modeling on how point and nonpoint source nutrient
10 loads impact transparency in Great Bay and tidal
11 rivers?

12 A. No.

13 Q. No.

14 How about how it would have impacted
15 algal growth in the Great Bay or tidal rivers?

16 A. How turbidity?

17 Q. Oh, no. No, no. I'm sorry. I'll --

18 A. Can you start it again.

19 Q. I'll start it over again.

20 Did you ever do any water quality
21 modeling of how point and nonpoint source nutrient
22 loads affect algal growth in the water column in
23 Great Bay or the tidal rivers?

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1 A. By -- you're restricting that to
2 phytoplankton?

3 Q. Yes, phytoplankton.

4 A. No.

5 Q. Okay. So do you -- one of the issues
6 that's come up on, as you know, with Great Bay, is
7 this whole issue of what nitrogen limit do they --
8 should the wastewater plants be initially directed
9 to, and there is a variety of opinions, as you know,
10 on this.

11 *So with regard to the research you
12 have done to date, do you know whether or not an
13 8-milligram-per-liter limit versus a
14 5-milligram-per-liter limit versus a
15 3-milligram-per-liter limit is required to protect
16 eelgrass resources in Great Bay?

17 MS. VAN OOT: I'm going to object on
18 the grounds of the protective order. I think
19 you're asking him for an opinion other than
20 the opinions expressed in the February 2012
21 e-mail.

22 MR. KINDER: Well, let's see if he has
23 any.

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1 MR. HALL: Well, actually, I thought
2 you might say that, because part of the letter
3 in December 22, 2011, that Dr. Short authored,
4 talks about all wastewater plants in the
5 watershed should advance to a discharge of 8
6 milligrams per liter in the next two to three
7 years.

8 MS. VAN OOT: Okay. Well, I've got two
9 objections going here. I've got Tupper's
10 objection and I've got your objection. So
11 which one are we addressing?

12 MR. HALL: Which one would you like to
13 do first?

14 MR. KINDER: Let's find out if he has a
15 opinion.

16 MS. VAN OOT: You can answer the
17 question yes or no.

18 A. I'm not sure what the question was.

19 Q. I knew you were going to say that.

20 MS. VAN OOT: That's what lawyers do.

21 MR. HALL: Could you read it back.

22 **(Last question read back by the*
23 *reporter.)*

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1 MS. VAN OOT: Opinion based on your
2 research to date.

3 A. And "research" is -- are we defining
4 "research" as just observational or are we defining
5 research that projects that lead to answering some
6 question?

7 Q. Projects that lead to answering some
8 type of question.

9 A. No.

10 Q. Okay. Did you ever study whether or how
11 organic nitrogen converts to inorganic nitrogen forms
12 in Great Bay Estuary?

13 A. No.

14 Q. A little bit earlier, when you were
15 giving me an answer, you had mentioned something
16 about some long-term trend work that you had been
17 doing, so I've got a couple long-term-trend
18 questions, because it's been also an issue of
19 interest with regard to the nutrient requirements of
20 Great Bay.

21 Did you ever do any long-term-trend
22 analysis of nutrient levels for Great Bay or the
23 tidal rivers?

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1 A. Yes.

2 Q. Could you please explain what you have
3 done?

4 A. I think back in the early '90s -- yeah,
5 I'm sure it was the early '90s -- I looked back at
6 the historical data on nutrient dynamics, nitrogen
7 and phosphorus, in the tidal rivers and Great Bay, to
8 try and assess whether change was -- could be
9 detected.

10 Q. Okay. Well, let's try post 19 -- I'll
11 pick a date -- post-1993. I apologize.

12 A. Yeah.

13 Q. Say post-1990. Have you been working on
14 any long-term-trend analysis of nutrient levels of
15 Great Bay or the tidal rivers?

16 A. In that time period, yes. I just
17 answered that, I think.

18 Q. Oh. I thought that one, it sounded like
19 you were looking at data from before 1990.

20 A. I was looking at data from before, but
21 that was done in that time period.

22 Q. All right. Over what time frame does
23 this long-term-trend analysis of nutrient levels

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1 cover?

2 MS. VAN OOT: I'm sorry, I've lost you.

3 Which long-term-trend analysis?

4 MR. HALL: The one that Dr. Short said
5 he has done.

6 A. I think it was the data from the '70s,
7 '80s, then there was a break, and some data in the
8 late '80s.

9 Q. Okay.

10 A. So it was 10 -- 20 -- 10 years, or 20
11 years. 10 to 20 years.

12 Q. Okay. Focusing primarily on the '70s
13 and '80s?

14 A. Yeah.

15 Q. Okay. So I gather you don't have the
16 same analysis done for the '90s and '00s?

17 A. No. Phil Trowbridge did that.

18 Q. Phil Trowbridge did that.

19 Did you ever do any long-term-trend
20 analysis of transparency levels for Great Bay or the
21 tidal rivers?

22 A. Not specific measurements of
23 transparency.

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1 Q. Okay. Is there something else that you
2 would have -- you would be thinking is a --

3 A. I measure light levels at depth, which
4 is related to the transparency of the water.

5 Q. Okay. So with regard to the -- maybe
6 you can tell me whether or not you've done any
7 long-term-trend analysis of the light levels within
8 Great Bay and the tidal rivers, I'll say since 1990.

9 A. No, not -- not comprehensively.

10 Q. Okay. Same question: long-term-trend
11 analysis of turbidity, turbidity levels -- and this
12 is in the water column -- for Great Bay or the tidal
13 rivers?

14 A. And when you say "turbidity," you're
15 talking only about suspended sediments?

16 Q. Yes, sir.

17 A. Well, aside from the one I mentioned
18 from the Bellamy, no.

19 Q. Okay. Did you ever do anything from the
20 Lamprey River?

21 A. No.

22 Q. The Squamscott?

23 A. Well, in '92 I put out the Great Bay

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1 Profile, an assessment of everything we know about
2 Great Bay at the time, and I believe we compiled
3 turbidity data as part of that.

4 Q. At that point in time?

5 A. Yeah.

6 Q. Okay.

7 A. And that covers all these things.

8 Q. And -- well, let's switch to another
9 one, just so I can make sure I've got my bearings
10 straight and I'm not asking you to overstate what you
11 did or you didn't.

12 Upper Piscataqua River, did you do
13 any -- have you ever done any long-term-trend
14 analysis of the turbidity levels in that area?

15 A. No.

16 Q. Okay. What about by the mouth of the
17 harbor? Long-term analysis down there?

18 A. That was included in that study because
19 we had some data from the coastal lab.

20 Q. Oh, so the 1992 study?

21 A. Yeah.

22 Q. All right. So after 1992, had you
23 done --

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1 A. No.

2 Q. -- any -- no. Okay.

3 Now, earlier, you had mentioned that
4 you didn't consider yourself to be a macroalgae
5 expert, so I'll ask the question, but I think I know
6 the answer.

7 Did you ever do any long-term-trend
8 analysis of macroalgae levels in Great Bay or the
9 tidal rivers?

10 A. Not specifically long-term-trend, or
11 not -- not an analysis that was written down or
12 published.

13 Q. Did you measure macroalgae levels in
14 various areas of the bay or tidal rivers?

15 A. No.

16 Q. No.

17 And then the last question in the loop
18 is algae. Did you ever do any long-term-trend
19 analysis for changing algal levels -- and by
20 "algae," I mean phytoplankton -- for Great Bay or
21 the tidal rivers?

22 A. Since '92?

23 Q. Since '92. Thank you.

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1 A. No.

2 Q. No.

3 Thank you for the correction. I
4 appreciate that.

5 I'm going to show you a copy of the --
6 and we'll mark this as Exhibit --

7 MR. KINDER: Let me do 2. This will be
8 1, which is the court's order.

9 MR. HALL: Court's order. We'll mark
10 this one as Exhibit 2.

11 *(Short Exhibit 1 and 2 are marked for*
12 *identification.)*

13 Q. This was an e-mail dated December 22,
14 2011, sent to Steven Perkins, several other people at
15 the EPA. Other people were cc'ed, including Dean
16 Peschel, Rachel Rouillard, Phil Colarusso, and
17 others. Phil Trowbridge, State of New Hampshire.
18 And it's entitled "Response to the Great Bay
19 Municipal Coalition Adapted Management Plan."

20 I'd like to ask you a couple questions
21 about this e-mail.

22 MS. VAN OOT: Okay. Before you do, I
23 need to tell you that Professor Short is

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1 dyslexic. So if you are going to be asking
2 him about specific paragraphs or sentences in
3 here, I would ask that you read the paragraph
4 ahead and the paragraph after and the
5 paragraph that you want to ask him questions
6 about.

7 MR. HALL: Okay.

8 MR. KINDER: Well, I'm --

9 MR. HALL: Go ahead, Tupper.

10 MR. KINDER: I'm responding because I
11 was at the hearing.

12 MS. VAN OOT: Right.

13 MR. KINDER: This document, Exhibit
14 2 -- John's got a very short statement that I
15 presume he's going to ask about. The
16 paragraph above and below are long. I
17 don't --

18 MS. VAN OOT: Actually, they're not.

19 MR. KINDER: Well, even so, it seems to
20 me, since this is a time-sensitive deposition,
21 that asking for those things, if it's -- if
22 it's necessary, if Mr. Short doesn't
23 understand the question, then maybe that's --

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1 maybe that's appropriate.

2 Could we proceed in that fashion?

3 MR. HALL: And Fred, I feel your pain.
4 I'm dyslexic also. So I -- I'm good with
5 numbers.

6 THE WITNESS: Find somebody else to
7 read it.

8 MR. HALL: I know, which is, you
9 know -- well, actually, no. I reverse
10 numbers, which is -- it's a good thing I was a
11 math major like you, because you know, you
12 don't use numbers in questions. You just go
13 with letters. So it's a --

14 MS. VAN OOT: Okay. How about with
15 start with just reading the statement that you
16 want him to look at and then --

17 MR. HALL: We don't even have to go
18 there yet. I just have a few preliminary
19 questions first, and then . . .

20 BY MR. HALL:

21 Q. This e-mail that provides an opinion on
22 the coalition's adaptive management plan, did anyone
23 ask you to provide comments on the plan? I mean --

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1 meaning did EPA or CLF or DES ask for you to please
2 send your observations and comments on the adaptive
3 management plan, or did you do this all just because
4 you wanted to?

5 MS. VAN OOT: Okay. I'm going to
6 object to the form of the question.

7 You can answer if you understand it.

8 A. I did it because I wanted to.

9 Q. Okay. Did you discuss the contents of
10 this response with either EPA, DES, or CLF before it
11 was submitted to EPA?

12 A. I really am not sure.

13 Q. Okay. So you may have, but you don't
14 remember?

15 A. Right.

16 Q. Right. Okay.

17 A. I know I did talk to a number of people
18 about it, including, I think to Dean, I think to
19 other -- well, I brought it up at a couple meetings,
20 because I felt that there were some -- I was
21 initially under the impression that the coalition's
22 thing was put out as a draft when it was originally
23 put out, and that's why I looked at it, and found

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1 things that I thought could be corrected by the next
2 creation of the document. And then I heard it had
3 already been submitted to EPA. So . . .

4 Q. Okay. Fine. I appreciate that
5 clarification.

6 There are a number of statements in
7 here that I -- that the coalition ended up taking an
8 issue over, and they have to do with what I'll call
9 various statements over research claims or research
10 that was available. And I'm going to just read a
11 couple of them. I don't know that I have to read
12 all six right now, seven that we've got marked. And
13 then I'm going to ask you -- well, actually, I
14 probably need to go one at a time. Let's just do it
15 this way.

16 Under No. 1: "My long-term research
17 and annual monitoring of eelgrass in the estuary has
18 clearly demonstrated that eelgrass is disappearing
19 from the estuary" -- and here's the point -- "due to
20 excess algal growth caused by increasing nitrogen
21 levels in the water. There simply is no doubt about
22 this fact."

23 A. Okay.

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1 Q. Okay. Can you tell me who that research
2 was presented to? And when I'm asking who, like from
3 the State or the federal government or PREP or TAC.
4 You know, long-term research and annual monitoring
5 showing that eelgrass was disappearing because of
6 excess algae growth caused by increased nitrogen
7 levels.

8 A. Well, there are a number of different
9 sources of data. A lot of it is observational
10 information where I've -- I mean, I -- observations
11 that I had made. And, for example, I mentioned
12 earlier the Port Authority mitigation monitoring,
13 which was a 15-year monitoring program. And that
14 was -- that was one of -- and that's published in a
15 paper that I sent to the coalition.

16 Q. And I'm going to -- I guess we'll end up
17 going through the individual papers one at a time.

18 But if I was going to look for a
19 research piece that you have published -- let's say
20 formally or informally -- that you've published,
21 presented to the State or to EPA or as part of your
22 database, that showed nitrogen caused increasing
23 algal growth and it was that change in increasing

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1 algal growth that caused the eelgrass to climb,
2 where would I find that document?

3 A. It's a publication which I've sent to
4 you. It should be in your e-mails, Short, et al.,
5 1995, published in Limnology and Oceanography.

6 Q. Okay.

7 A. Also Burdick, and -- who is the other
8 author? A student. Kaldy. Short, Burdick, and
9 Kaldy.

10 Q. I'm going to show you a copy of that
11 paper, the 1995 paper, and I'm going to ask you -- is
12 this the paper you're referring to in your response?

13 (Handing)

14 A. Short, Burdick, and Kaldy.

15 MR. HALL: Let's mark that as Exhibit

16 3.

17 *(Short Exhibit 3 is marked for*
18 *identification.)*

19 Q. Can you please show me where in this
20 paper it confirms nitrogen is causing excessive algal
21 growth which is the cause of eelgrass losses in
22 Great Bay?

23 MS. VAN OOT: Okay. I'm going to

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1 object to the question. You have just handed
2 the witness a nine-page publication that he
3 did back in 1995, and you're apparently asking
4 him to read through it to locate a particular
5 statement, after I made clear to you that
6 Professor Short has dyslexia and that will
7 take him some time.

8 MR. HALL: Well, I guess I'm asking
9 Dr. Short if he can point out the table or the
10 page or anywhere in this report where this
11 analysis would show me that for Great Bay.

12 Q. And this is a paper that was done in --
13 it was published in 1995, and it was based on
14 research conducted in 1988 and 1990, as I read the
15 front --

16 A. Mm-hmm.

17 Q. -- that how this paper could confirm
18 that eelgrass losses that I understand happened in
19 Great Bay two decades later were caused by algal
20 growth.

21 MS. VAN OOT: Object to the form of the
22 question.

23 MR. KINDER: You can answer.

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1 A. Okay. Well, the -- the graph on Figure
2 3 --

3 MS. VAN OOT: Which page?

4 A. It's on 744. C, the biomass versus
5 nutrient level. The first three bars are plants
6 growing in ambient conditions. That means under
7 normal conditions that you see in the bay. And the
8 next three bars are eelgrass biomass growing at
9 enriched conditions, where we increased the amount of
10 nitrogen in the water and looked to see what happened
11 with -- in response to that over time.

12 Q. Okay.

13 A. And this was done at the Jackson
14 Esturine Lab with water directly out of the bay.

15 Q. All right. Two questions, or a couple
16 questions on that. How does this tell me that there
17 was a substantial increase in algal growth?

18 A. You'd have to read -- you would have to
19 read the text. That's not spelled out, that that's
20 the . . .

21 Q. And in terms of these enriched
22 conditions, can you tell me whether or not this paper
23 compared the conditions you used in your enriched

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1 tests to the conditions actually occurring in
2 Great Bay?

3 A. Well, the conditions occurring in Great
4 Bay were the ambient at that time, that was
5 background level, on the -- on -- that depended.
6 Added to, no extra nitrogen added. And the enriched
7 were elevating them above that. And I know somewhere
8 it says how much above that, but I can't remember.
9 Whether it's the same as what they were -- the bay is
10 at now, I don't -- I couldn't forecast it at that
11 point, of course.

12 Q. Okay. That's fine.

13 Now, in terms of -- let's go back to
14 Exhibit 2 again. That's the one with the little
15 yellow markings on that.

16 There's another statement on the next
17 page, on page 2, Portsmouth Harbor -- "In Portsmouth
18 Harbor, eelgrass has been declining for the past
19 five years as a result of reduced water clarity
20 cause by nitro" -- "rising" -- let me -- I'll start
21 from scratch again.

22 "In Portsmouth Harbor, eelgrass has
23 been declining for the past five years as a result

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1 of reduced water clarity caused by rising nitrogen
2 inputs that foster increased phytoplankton growth in
3 the water (microscopic algae)."

4 Where would I find any publication
5 you've done that has the data showing that sequence
6 of events has occurred and was the cause of any
7 eelgrass reductions in the Portsmouth Harbor area?

8 A. The -- it's combined from two different
9 sources, actually. One source is a student's
10 master's PhD thesis, who monitored light levels at
11 the deep edge and the shallow edge of eelgrass beds
12 over time, and a bunch of other things as well. And
13 so that basically was -- documented the change in
14 water clarity.

15 And the connection to phytoplankton
16 production is from my observational observation,
17 having been in that Portsmouth Harbor every year for
18 the last 20 years and seeing the water color change
19 from blue to green, which is pretty diagnostic and
20 very evident when you're under the water.

21 Q. Can you tell me what the actual change
22 in algal level has been in Portsmouth Harbor in the
23 past 10 years? It went from X to Y? Do you know

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1 what it is, or is this just visual?

2 A. Just visual.

3 Q. Just visual. Okay.

4 I'm just curious. In the eelgrass beds
5 in Portsmouth Harbor, are they reducing only in the
6 areas that are the deepest or are they reducing in
7 areas that are also shallow?

8 A. They started at the areas that were
9 deepest, and now it's pretty much decreasing
10 everywhere.

11 Q. Decreasing everywhere?

12 A. Yeah. Well, not in every area, but a
13 lot of areas, anyway.

14 Q. The PhD thesis that you're saying you're
15 relying on to reach --

16 MS. VAN OOT: Objection to the form of
17 the question.

18 Q. Oh.

19 In your last answer, you mentioned that
20 your response to Point No. 2 that you were relying
21 in part to some PhD thesis that was done. Can we
22 get our -- has that PhD thesis been submitted to the
23 State as information to show what's causing eelgrass

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1 losses in this area of the estuary?

2 A. No.

3 Q. Has it been submitted to anyone?

4 A. No.

5 Q. Can we get a copy of it?

6 A. No, I don't believe I can give that out.

7 Q. Okay.

8 A. Part of -- a related part of her
9 dissertation was -- has been published in 2010, but
10 not this specific part as yet.

11 Q. Okay. With regard to Great Bay, you
12 mentioned that there's areas that are declining in
13 biomass and becoming overgrown with nuisance
14 macroalgae. That's under Bullet Point 4.

15 A. Mm-hmm.

16 Q. Can you tell us where --

17 MS. VAN OOT: Actually, there aren't
18 any bullet points.

19 Q. Oh, I didn't number yours?

20 A. No.

21 Q. Oh, I'm sorry.

22 A. So it's been a little vague here.

23 Q. Oh, yeah. I'm saying numbers and you're

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1 probably looking and saying, you know, "Where's
2 that?"

3 Can you tell me where in Great Bay
4 those conditions are occurring?

5 MS. VAN OOT: Do you want to read it?

6 Q. If you know.

7 A. You want to know where the -- where
8 macroalgal seaweed biomass is increasing?

9 Q. Yeah. Just -- "With increased nitrogen
10 into the bay, these beds are declining, losing
11 biomass, and becoming overgrown with nuisance
12 macroalgae."

13 Where precisely in the bay is that
14 occurring?

15 A. I can -- I could -- I have that
16 information. I could tell you that.

17 Q. Oh. You have it, but you -- I'm sorry.
18 Could you repeat your answer, Doctor.

19 A. You asked me if I could --

20 Q. Tell me.

21 A. -- tell you, and I'm saying yes, I
22 could. I have that information.

23 Q. Okay. Where is it occurring?

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1 A. I could -- I don't think you'll
2 understand what I'm saying when -- I'm saying it's
3 occurring throughout much of the bay to differing
4 degrees. It's -- you know, the part that's affecting
5 eelgrass is where the eelgrass beds are, and you've
6 seen my maps of those. There are areas where the
7 seaweeds collect in greater abundance, and you
8 obviously find more seaweed in those areas.

9 Q. And if I were looking for a report that
10 would tell me where this is occurring and how much
11 it's occurring, what report would you direct me to?

12 A. I don't think -- I don't think there's
13 any published report --

14 Q. Okay.

15 A. -- at this point.

16 There is a -- there is a report that --
17 where an attempt was done to look at that, using
18 fancy aerial imagery, and that was reported to PREP.
19 It was a PREP study.

20 Q. Do you know when that was admitted?

21 A. 2008 or 9.

22 Q. Okay. All right. A little further
23 down --

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1 A. I wasn't the first author on it.

2 Q. A little further down the page, the
3 next-to-last yellow point -- that's the one -- where
4 it says, "In the Piscataqua River and Little Bay, the
5 eelgrass losses were primarily" -- oh, I'm sorry --
6 "were predominantly a result of reduced transparency,
7 and, to a lesser extent, excessive epiphyte growth."

8 Where would I find research showing
9 that those -- that statement is correct?

10 A. The first part of it, the transparency
11 part, is in another student's thesis. And the
12 epiphyte is just anecdotal observation.

13 Q. Okay. Now, I'm going to ask a question
14 on this later on, but I'll divert for a second,
15 because we're talking about Little Bay.

16 My understanding was that the eelgrass
17 populations in Little Bay declined rather
18 precipitously and dramatically after the -- was it
19 1988 or 1989 wasting disease?

20 A. In Little Bay? I don't -- I think it
21 was more -- what, '88-'89?

22 Q. Mm-hmm.

23 A. That was Great Bay, primarily. And

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1 Little Bay had, I think, disappeared quite a while
2 before that.

3 Q. Before -- so Little Bay had disappeared
4 before that?

5 A. Not completely, but the major decline
6 had occurred sometime before '83.

7 Q. Oh, really?

8 A. Yeah.

9 Q. Okay. Well, that might explain why, in
10 several of the State reports that I've read, they
11 said that people don't know the reason that the
12 eelgrass declined in Little Bay because it happened
13 so long ago.

14 MS. VAN OOT: Objection to the form of
15 the question, if it was a question.

16 Q. Are you aware that the State has
17 published numerous reports that say the -- no one
18 understands why the eelgrass were lost in Little Bay?

19 A. Who from the State has done that?

20 Q. DES. State of the Estuary reports. The
21 impairment reports for 2008, '10, and '12.

22 A. I may be confused, but I'm not sure that
23 that's what they say.

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1 Q. Okay. Well, we'll loop back to that
2 later. I can show you one of them.

3 So I guess my question is, if you've
4 got somebody working on a thesis on this today,
5 or -- well, actually, let me ask you a question
6 about this.

7 Over what time frame does this person's
8 thesis cover for Little Bay?

9 A. Oh. They all run together now.
10 I think probably 2007 to 2009.

11 Q. Okay.

12 A. Give or take a year.

13 Q. All right. And so it's only within
14 that -- I'll ask the question.

15 Is it only within that time frame that
16 this assertion that transparency, reduced
17 transparency caused by nitrogen caused by excessive
18 algal growth has caused additional declines in the
19 system?

20 MS. VAN OOT: Object to the form of the
21 question.

22 You can answer it.

23 A. No. It's in my own observations

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1 unrelated to these studies.

2 Q. Okay. And what information or
3 publication could I look at that I could objectively
4 assess whether or not this sequence of events is
5 actually demonstrated by data?

6 A. I just said it was my observation, so I
7 think that precludes there being actual data.

8 Q. Okay. Let's -- could we go to the next
9 page, at the top. This is the last question I have
10 on this. It makes a statement about dissolved
11 organic nitrogen. It says, "Excessive macroalgae
12 growth is stimulated by DIN" -- which is dissolved
13 inorganic nitrogen -- "but dissolved organic nitrogen
14 (DON) and other forms of nitrogen are rapidly
15 converted to DIN once they enter the estuary."

16 Can you tell me what research or
17 publication that statement is based on?

18 A. It's pretty basic knowledge in coastal
19 oceanographic literature. You know, it's the whole
20 biogeochemical cycles: breaking down organic carbon
21 and turning it into inorganic -- organic nitrogen and
22 turning it into inorganic nitrogen.

23 Q. Okay. I'll be much more specific with

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1 the question here.

2 With regard to the Great Bay Estuary,
3 did you perform any research or analyses of
4 dissolved organic nitrogen levels converting to
5 dissolved inorganic nitrogen levels within the
6 system?

7 A. Well, I mean, Great Bay isn't that
8 unique. The processes that happen everywhere else
9 would also happen here.

10 Q. I'm asking you whether or not this --

11 A. No, I have not done any studies.

12 Q. Okay. Thank you.

13 With regard -- I'm going to show you
14 Exhibit 21, and it's a letter with an attachment
15 that you received -- I'm sorry. I shouldn't have
16 said "Exhibit 21." It's Exhibit 4.

17 Actually, I want to mark also -- we'll
18 mark it as Exhibit 5 -- "The Mesocosm Experiment
19 Quantifying the Effects of Eutrophication on
20 Eelgrass."

21 MR. KINDER: That's marked already.

22 That's 3.

23 MR. HALL: Oh, okay.

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1 THE WITNESS: I gave her mine.

2 MR. HALL: Thank you.

3 THE WITNESS: Can I get some water?

4 MR. HALL: Sure.

5 *(Pause in the proceedings.)*

6 *(Short Exhibit 4 is marked for*
7 *identification.)*

8 BY MR. HALL:

9 Q. Okay. I'm showing you a letter dated
10 January 23, 2012. It was directed to you and
11 Great Bay Municipal Coalition. It attaches a number
12 of reports and analyses done by HydroQual, and
13 there's a fair amount of information regarding the
14 long term trends and various parameters at a number
15 of stations in Great Bay.

16 Dr. Short, are you familiar with this
17 letter?

18 A. Mm-hmm.

19 Q. Okay.

20 A. Yes.

21 Q. Did you look at the HydroQual report and
22 the attachments to look at the trend in data analyses
23 that was in this correspondence?

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1 A. No.

2 Q. No.

3 Can you tell me why you didn't look at
4 it?

5 A. I was rather put off by the letter, and
6 the appendices seemed long and excessive and I just
7 didn't bother.

8 Q. You did read the cover letter, though;
9 right?

10 A. Yes.

11 Q. I'd like to ask you about a couple of
12 the statements in the cover letter that's on the
13 front page, the A, B, C, and D, and I'd like to go
14 through these four bullets and ask you to tell me
15 what in fact is incorrect with the statements that
16 are in those bullets, if anything is in fact
17 incorrect with them. And they're based on the
18 analysis that HydroQual did and the coalition's
19 review of the long-term-trend data.

20 Bullet A: "HydroQual is saying that
21 it's confirmed that there were no analyses or data
22 in the record." And when we're talking about in the
23 record, we're talking about the 2009 criteria

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1 document and papers that were submitted to TAC and
2 things that were, you know, made available to the
3 public. That's what we're talking about.

4 A. Where does it say that?

5 Q. No. That I'm explaining.

6 A. Okay. But you didn't say that in the
7 letter?

8 Q. No. I mean, what HydroQual did was,
9 they contacted Phil Trowbridge and asked him for all
10 the background information they could find on various
11 parameters that were mentioned in your earlier
12 e-mail.

13 MS. VAN OOT: I think you need to set a
14 foundation for the question.

15 MR. HALL: Well, on this -- the
16 foundation for these questions go back to
17 Dr. Short's statements in the December 22
18 e-mail that talks about long-term research and
19 monitoring confirming that eelgrass had
20 disappeared due to excessive algal growth
21 caused by increasing nitrogen levels.

22 MS. VAN OOT: No. Your question was
23 directed towards A, B, C, and D --

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1 MR. HALL: Yes.

2 MS. VAN OOT: -- and you prefaced it
3 with a reference to specifically HydroQual has
4 confirmed there are no analyses or data in the
5 record showing the following, and then you
6 went on to explain what your understanding of
7 the record is.

8 MR. HALL: Okay.

9 MS. VAN OOT: And I just don't know
10 that the Professor Short has the same
11 understanding of the record. So your question
12 is unfair.

13 *BY MR. HALL:*

14 Q. I'll just ask you whether you agree with
15 the statements, that there's no information showing
16 transparency has materially decreased during the
17 period of significant eelgrass decline --

18 MS. VAN OOT: Same objection.

19 Q. -- in Great Bay.

20 MS. VAN OOT: Same objection.

21 MR. KINDER: Just ask the first
22 question.

23 MS. VAN OOT: Right.

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1 MR. HALL: Well, he just did.

2 MS. VAN OOT: No, he didn't. He said
3 no information in the record.

4 MR. HALL: Okay.

5 MS. VAN OOT: Without establishing what
6 Professor Short's understanding of is the
7 record. If you want to ask him whether he --

8 *BY MR. HALL:*

9 *Q. Dr. Short, do you disagree with the
10 statement that transparency has not materially
11 decreased during the period of significant eelgrass
12 decline in Great Bay?

13 MS. VAN OOT: That is not what it said.

14 MR. HALL: Well, I'm now asking the
15 question the way I want to.

16 MS. VAN OOT: Well, you can't say that
17 you're asking a question based on A, B, C, D,
18 and then read A incorrectly.

19 MR. KINDER: He's restated the
20 question, so he can proceed.

21 MS. VAN OOT: No, he can't. Well, he
22 can proceed over my objection.

23 MR. KINDER: Okay.

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1 MR. HALL: Correct.

2 MS. VAN OOT: Do you understand the
3 question?

4 THE WITNESS: Not completely.

5 MS. VAN OOT: Why don't you -- could we
6 read back the question, the last question.

7 **(Last question read back by the*
8 *reporter.)*

9 MS. VAN OOT: Could you do it again,
10 because that's not what A says.

11 **(Last question read back by the*
12 *reporter.)*

13 MS. VAN OOT: A says -- does not have
14 not "materially decreased," and it doesn't
15 have "Great Bay" in it.

16 So are you asking him -- if you want to
17 ask him that question, that's fine. But you
18 said you were asking him about A, B, C, and D.

19 Q. Could you please answer the question I
20 posed, Dr. Short?

21 MS. VAN OOT: Read it back one more
22 time and listen carefully.

23 A. It's not what's said here, so I'm not

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1 sure -- do you want me to answer the one that --

2 Q. Yes.

3 MS. VAN OOT: Could you read back the
4 question, please.

5 **(Last question read back by the*
6 *reporter.)*

7 A. It's such a double negative that it's
8 very hard to get your head around it.

9 I guess I'd like to know what you mean
10 by "materially decreased." I mean, is this a
11 statistical statement or some other --

12 Q. Enough to significantly affect eelgrass
13 growth.

14 A. And you said, in your question,
15 "Great Bay." But in here, we're talking about the
16 Great Bay Estuary. So are you talking just about
17 Great Bay or the whole system?

18 Q. Let's do Great Bay, and then we'll do
19 them one at a time.

20 A. Okay. The transparency has decreased
21 significantly in the Great Bay Estuary.

22 Q. Okay. And what data do you base that
23 on?

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1 A. Observation, personally, and the
2 master's student that I spoke of earlier, the thesis.

3 Q. And this master's thesis covers what
4 period of time?

5 A. I believe it was 2007 to 2009, but I'm
6 not positive.

7 Q. 2007 to 2009.

8 Is that based on data from that period?

9 A. Probably -- basically, but maybe going
10 back to 2006.

11 Q. To your knowledge, is there any data
12 from 2005 backward, showing that transparency had
13 significantly decreased in Great Bay?

14 A. There is data in the PREP reports, but I
15 don't remember the specific time periods that they
16 would have used.

17 Q. And do you recall which PREP report you
18 believe this data was in?

19 A. I think it's in the State of the
20 Estuaries report.

21 Q. Do you recall which one?

22 A. 2006.

23 Q. 2006?

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1 A. No. 2009.

2 Q. 2009?

3 A. Or both, maybe.

4 Q. Okay. Same question: Is there data
5 that shows -- that is confirmed that transparency has
6 materially decreased in the Piscataqua River over the
7 period of eelgrass decline in that water body?

8 A. Yes.

9 Q. And where is that data?

10 A. That's the same master's thesis.

11 Q. The same master's thesis.

12 Has that data been presented to DES and
13 EPA?

14 A. No.

15 Q. No.

16 A. It was offered to them.

17 Q. Portsmouth Harbor is the --

18 A. Yes. Same.

19 Q. Same time frame?

20 A. Mm-hmm.

21 Q. Same period?

22 A. Mm-hmm.

23 Q. Any other datasets?

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1 MS. VAN OOT: Form of the question.

2 A. No, I don't believe so.

3 Q. Now, HydroQual wouldn't have had access
4 to this master's thesis?

5 A. I don't know what HydroQual did.

6 Q. I mean, it's not generally available;
7 right?

8 A. That's right.

9 Q. Is there data showing that the existing
10 transparency in Great Bay, Little Bay, or Portsmouth
11 Harbor is insufficient, given the tidal variation in
12 the system?

13 A. Insufficient for what?

14 Q. To support eelgrass growth.

15 A. Yes.

16 Q. And --

17 A. The same master's thesis.

18 Q. Same master's thesis.

19 Do you know if that data is in any
20 PREP -- do you know if there were any other data in
21 a PREP report or any DES report that would be
22 publicly available?

23 A. Not that related to the tidal variation.

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1 Q. Okay. Can you -- is there any data or
2 analysis showing that nitrogen triggered excessive
3 phytoplankton growth, significantly lowering
4 transparency levels anywhere in the estuary?

5 A. I believe that's in the 2009 PREP
6 report, State of the Estuaries report.

7 Q. So you think the PREP report showed the
8 nitrogen triggered phytoplankton growth, which then
9 triggered a lowering of transparency, and that's in
10 the PREP report?

11 A. No, I wasn't targeting that aspect of
12 the question. They show trends in nitrogen over that
13 time period.

14 Q. They show trends in nitrogen?

15 A. Right.

16 Q. I agree that the PREP report certainly
17 showed trends in nitrogen, Dr. Short. There's no
18 question about that.

19 Do you know if the PREP reports also
20 showed that the trends in nitrogen caused a trend in
21 phytoplankton growth?

22 A. I don't know if they showed that or not.

23 Q. Don't know. Okay.

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1 And do you know if the PREP reports
2 actually contained the transparency levels changing
3 over time?

4 A. Not expressed as transparency, no.

5 Q. What would it have been expressed as?

6 A. Suspended sediments or suspended
7 sediments and phytoplankton.

8 Q. Okay. So -- with your thesis that if
9 the suspended sediments go up, the transparency is
10 increased?

11 A. Right. I mean, that's basic
12 oceanography, you know.

13 Q. I wasn't saying I was disagreeing. I
14 was just trying to understand the basis of the
15 statement. Thank you.

16 Do you know of any data or analyses
17 showing suspended algal growth is a substantial
18 component affecting water column transparency
19 anywhere in the estuary?

20 A. So you're talking phytoplankton?

21 Q. Yes, sir.

22 A. Not in a single document, no.

23 Q. When you say "not in a single

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1 document" --

2 A. Well, PREP shows that -- PREP shows the
3 increases in phytoplankton, I believe, and it shows
4 decreases in -- or increases in nitrogen and
5 increases in phytoplankton, as part of the whole
6 nitrogen dynamics.

7 Q. Okay. Do any of those analyses show
8 that the phytoplankton component is a very
9 significant component of what's affect -- what would
10 affect light transmission in the bay?

11 A. I don't think they look at that
12 specifically.

13 Q. Okay. So in terms of some of the other
14 earlier things that we covered, and I certainly don't
15 want to put words in your mouth, I want to --
16 withdraw that question.

17 With regard to the Piscataqua River,
18 can you tell me what the state of the eelgrass
19 condition is there?

20 A. It's completely gone from the upper
21 Piscataqua.

22 Q. It's completely gone?

23 A. Yes.

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1 Q. Is it gone in both the areas that are
2 shallow and deep?

3 A. Yes. They're not -- they're not shallow
4 like the areas in Great Bay are shallow.

5 Q. But are there areas in the upper
6 Piscataqua where eelgrass are -- would have been in
7 some shallower zones, or had been?

8 A. Historically --

9 MS. VAN OOT: Wait, wait. I object to
10 the form of the question. You can answer.

11 A. Historically, they may have been.
12 But -- well, there's some historical data that
13 suggests that they -- that it was there. But not
14 since I've been observing it.

15 Q. Do you know if in the shallow areas
16 of -- the upper Piscataqua and the lower
17 Piscataqua -- because I know you've done quite a more
18 bit more research, I believe, on the lower
19 Piscataqua.

20 A. Mm-hmm.

21 Q. So the shallower areas of the upper
22 Piscataqua and the lower Piscataqua, do you know if
23 the transparency levels are insufficient in those

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1 areas to maintain eelgrass growth?

2 A. Can you tell me where your demarcation
3 of upper and lower is? Are we talking the whole
4 Piscataqua from the Mildred Long Bridge north?

5 Q. Yeah. Why don't we try that.

6 A. No, I can't tell you.

7 Q. You can't tell me. Okay.

8 In response to the letter, Exhibit 4,
9 to Dr. Short, you sent -- you sent some e-mails back
10 to Dean Peschel; correct?

11 A. Yes.

12 MR. HALL: Okay. I'd like this marked
13 as Exhibit 5.

14 *(Short Exhibit 5 is marked for*
15 *identification.)*

16 Q. This is an e-mail to Dean Peschel. One
17 is dated -- there are actually two e-mails. One is
18 dated February 6, 2012, and the other one is also
19 dated February 6, 2012. Looks like one e-mail was
20 sent about a half an hour after the prior one.

21 MS. VAN OOT: No, no.

22 MR. HALL: It looks like one came out
23 at 10:07 and the other one came out at 10:31

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1 is what I have for the two e-mails.

2 MS. VAN OOT: I'm not following you.

3 MR. HALL: Marty, if you look at the
4 top of the page, it tells you what the time it
5 was sent. It says Monday, February 6, 2012,
6 10:07 a.m.

7 MS. VAN OOT: That is the full reading
8 of the e-mail from Mr. Peschel to his counsel
9 and everybody else in this room, not the
10 e-mail from --

11 MR. HALL: Oh. Right you are. I'm
12 sorry. That was my confusion.

13 MS. VAN OOT: That's what I thought.

14 MR. HALL: Here -- this -- thank you
15 for that clarification.

16 This e-mail from Fred Short to Dean
17 Peschel was on February 4 --

18 MS. VAN OOT: The first one.

19 MR. HALL: -- the first one, at 2012,
20 at the impressive time of 6:52 a.m. in the
21 morning.

22 MS. VAN OOT: 6:54.

23 MR. HALL: I've got 6:52 on the first

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1 one. And then the second one was sent at 6:54
2 a.m. in the morning.

3 MS. VAN OOT: Okay. Gotcha.

4 MR. HALL: And it's -- one is labeled
5 "papers 1 of 2" and the other one says "papers
6 2 of 2."

7 BY MR. HALL:

8 Q. Okay. Dr. Short, can you tell me what
9 this -- what this e-mail is all about, from you to
10 Dean Peschel?

11 A. I believe in an earlier e-mail I said I
12 would send some publications, and they weren't
13 included with that e-mail.

14 Q. Okay.

15 A. And this was a follow-up, sending them
16 in two separate e-mails.

17 Q. Okay. And why were you sending those
18 publications off to Dean Peschel?

19 A. I believe he requested background
20 information that supported my statements.

21 Q. And the statements that you're talking
22 about are the statements that were in the December 22
23 e-mail?

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1 A. Yes. Exhibit 2.

2 Q. Exhibit 2? Would that be correct?

3 A. Yes.

4 Q. Okay. So I've got -- oh, 12 or so
5 papers that you sent along, and we could go through
6 each one. Maybe we can just -- you can just tell me
7 with regard to each paper, tell me whether or not the
8 paper had Great Bay-specific data and analysis to it
9 or if it was just a more generalized research paper.
10 If you know.

11 A. My assumption in sending these papers
12 was that the oceanography and the hydrodynamics and
13 the ecology of Great Bay is not that different than
14 ecological and -- ecological seagrass and eelgrass
15 populations in other locations.

16 So many of those were related to other
17 studies. For example, identification of loss of
18 eelgrass in Waquoit Bay, Massachusetts, back in the
19 '90s, that basically followed the exact same
20 scenario we see happening here, 20 years ago.

21 Q. Okay. So why don't we -- why don't we
22 just try to quickly go through these, and then you
23 can tell me which one is a Great Bay and which one

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1 wasn't.

2 A. Okay.

3 Q. And we can go from there.

4 MR. HALL: I think we'll probably just
5 mark these in sequence. Marty, I can give you
6 a copy on each one, but I'm just going to ask
7 him if it's a Great Bay or not a Great Bay
8 study.

9 MS. VAN OOT: I'd like a copy.

10 MR. HALL: Sure.

11 Q. Dr. Short, the paper entitled "Nitrogen
12 Uptake by Leaves and Roots of Seagrass," and I will
13 not try to pronounce the name, was that a study done
14 specifically for Great Bay or not?

15 A. No.

16 MR. HALL: Let's mark that as Exhibit
17 6.

18 *(Short Exhibit 6 is marked for*
19 *identification.)*

20 Q. The next paper is titled "Effects of
21 Sediment Nutrients on Seagrass: Literature Review
22 and Mesocosm Experiment."

23 Was this specific to Great Bay?

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1 A. It was done while I was at the
2 University of New Hampshire, and I consulted with
3 Dr. Art Mathieson, who is our seaweed ecologist at
4 the lab, and I did talk about experimental mesocosms
5 with eelgrass. So it was a study done in Great Bay,
6 or the Great Bay watershed, but in tanks, rather than
7 in the bay itself.

8 Q. Okay. And --

9 A. My thinking was influenced by what I was
10 observing at the bay.

11 Q. That's quite all right.

12 Did that study have anything to do with
13 transparency, to your knowledge?

14 A. No. This was -- this was part of a
15 volume from Aquatic Botany that I was the editor for,
16 and there were other papers in that volume that
17 covered transparency, photosynthesis transport, those
18 sorts of things.

19 MR. HALL: Okay. Let's mark it as No.

20 7.

21 *(Short Exhibit 7 is marked for*
22 *identification.)*

23 Q. Here's another paper entitled

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1 "Sustaining Eelgrass to Manage a Healthy Estuary."

2 And this was -- looks like a 1989 publication.

3 Was this specific to Great Bay, and did
4 it have anything -- if so, did it have anything
5 specifically to do with transparency light levels
6 necessary for --

7 A. Yes.

8 MS. VAN OOT: Well, wait.

9 Objection to the form of the compound
10 question.

11 Q. So is it specific to Great Bay?

12 A. It was specific to Great Bay and the
13 mesocosm experiments were run in Great Bay water,
14 Figure 4 and -- well, all of them, all of the
15 mesocosm studies. But Figure 4 shows how eelgrass
16 growth was affected by reduced light, and those were
17 experiments done at the lab.

18 Q. Was the reduced light related directly
19 to conditions in Great Bay?

20 A. No.

21 Q. No?

22 A. They were -- they were not.

23 MR. HALL: Okay. Let's mark that as

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1 Exhibit 8.

2 A. This is also a paper that summarizes the
3 effects of various impacts of -- talks about being
4 smothered by sediments, turbidity effects, those
5 things that are all happening in Great Bay presently.

6 *(Short Exhibit 8 is marked for*
7 *identification.)*

8 Q. You mentioned about plants being
9 smothered in Great Bay.

10 A. I said smothered and other factors that
11 influence eelgrass as in Great Bay.

12 Q. Oh, I'm sorry.

13 A. It's okay. You didn't paraphrase me
14 correctly.

15 Q. Sorry. So are eelgrass being smothered
16 in Great Bay?

17 A. No.

18 Q. Okay. I was just confused. I didn't
19 think they were, and I was just wondering if I had
20 heard incorrectly. I apparently had.

21 This next paper, "Natural and Human-
22 Induced Disturbances of Eelgrasses," is this a
23 Great Bay-specific paper?

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1 MS. VAN OOT: Wait. Are you marking
2 that?

3 MR. HALL: I will.

4 THE REPORTER: It will be 9 when we get
5 there.

6 A. Yes, it does talk about Great Bay.

7 Q. It talks about Great Bay or --

8 A. It includes data from Great Bay.

9 Q. Includes data from Great Bay?

10 A. Yes. It's a seagrass study that is
11 global in scope.

12 Q. That is what in scope?

13 A. "Global."

14 Q. Global in scope.

15 A. The same issues that are happening in
16 Great Bay are happening all over the world.

17 Q. Could this study tell me what the
18 necessary transparency level needs to be in
19 Great Bay?

20 A. I don't think so, no. Only that
21 transparency is something that causes eelgrass
22 decline almost everywhere.

23 Q. Something that may cause eelgrass

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1 decline; correct?

2 A. Yes.

3 MR. HALL: Okay. Thank you. That's 9.

4 *(Short Exhibit 9 is marked for*
5 *identification.)*

6 MR. HALL: Off the record.

7 *(Discussion held off the record.)*

8 BY MR. HALL:

9 Q. Back on the record, please.

10 Dr. Short, this report entitled
11 "Quantifying Eelgrass Habitat Loss in Relation to
12 Housing Development and Nitrogen Loading in Waquoit
13 Bay, Massachusetts," is this a Great Bay-specific --

14 A. Yes. This was done again while I was
15 Jackson Lab, in conjunction with Dave Burdick, who is
16 a scientist at the Jackson Esturine Lab, and it
17 documents the loss of eelgrass as a result of --
18 well, the loss over time, and relates the losses to
19 increasing housing in the watershed and increasing
20 nitrogen loading into the watershed.

21 Q. And this is a watershed in
22 Massachusetts?

23 A. It's a watershed in Massachusetts.

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1 Q. Okay.

2 THE REPORTER: That will be 10.

3 *(Short Exhibit 10 is marked for*
4 *identification.)*

5 Q. I'd like to show you another paper
6 entitled "The Seagrasses of the Western North
7 Atlantic." It would appear to be some type of survey
8 paper, but if you could please tell me about it.

9 A. A chapter which I published with my wife
10 in World Atlas of Seagrasses, which I was the editor
11 for -- an editor -- and it talks about the North
12 Atlantic, and I suspect talks about Great Bay as
13 well. Yes, it does.

14 Q. Okay. Is there information in this
15 document that would tell me what the transparency
16 level needs to be to protect eelgrass in Great Bay?

17 A. That's -- it might. The case study 20.1
18 on the second page is about Great Bay. I haven't
19 reread it, but it talks about the problems facing
20 Great Bay and about the transplant studies that we
21 did in the Piscataqua River, which thrived for a
22 while until the conditions in the Piscataqua River
23 got to be too bad to support them anymore.

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1 Q. Okay. Is there specific information in
2 there that I could look at -- that one could look at
3 to tell me, "This level of nitrogen is going to cause
4 this level of transparency impairment" or anything
5 like that?

6 A. All that in one paper, you've got to
7 fund somebody to do that, and not just -- otherwise,
8 it's all put together from little studies that are
9 unfunded or something like that.

10 Q. Would I take it from your pithy response
11 to me that the short answer would be that information
12 is not --

13 A. That would be a no.

14 Q. That would be a no. Okay. Thank you.

15 *(Short Exhibit 11 is marked for*
16 *identification.)*

17 Q. This next document is a page titled
18 "Global Overview: The Distribution and Status of
19 Seagrasses."

20 A. This is also from the World Atlas of
21 Seagrasses. Introductory chapter.

22 Q. Introductory chapter? Okay.

23 MR. HALL: Let's just mark that as

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1 Exhibit 12.

2 (Short Exhibit 12 is marked for
3 identification.)

4 Q. I'd like to give you a copy of a paper
5 that's called "Development of a Nutrient Pollution
6 Indicator Using Seagrasses Among Nature Gradients in
7 Three New England Estuaries."

8 Can you tell me whether or not this
9 paper provided information on the transparency
10 levels necessary to protect eelgrass in Great Bay?

11 A. This is specifically about Great Bay and
12 two other New England estuaries, one being Waquoit
13 Bay, the one we talked about before, that had the
14 eelgrass decline, and the other one being
15 Narragansett Bay, which is a deep-water,
16 phytoplankton-dominated system, which is also -- most
17 of it's eelgrass.

18 Q. Okay. Are there transparency analyses
19 in that paper.

20 A. There might be. It really don't know.
21 I can't remember. But it's -- the nice part about
22 this paper is it shows the deep-water system, which
23 is similar to the Piscataqua, and the shallow-water

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1 system like Waquoit Bay, which is similar to what's
2 going on in Great Bay, and how different types of
3 nutrient loading into the system affect how --
4 because it's a response.

5 For example, in Waquoit Bay, where it's
6 a shallow, flat system, it's affected by macroalgae
7 as in Little Bay, and the phytoplankton-dominated
8 system which we have in Narragansett Bay, it's light
9 limitation, and that has decreased and caused the
10 losses.

11 Q. Do you know if the phytoplankton levels
12 in Narragansett Bay are significantly higher than
13 those in Great Bay?

14 A. Narragansett Bay is a very big bay, and
15 there's almost any phytoplankton level you want,
16 depending on where you go. It's not -- you can't
17 really take an average from there and compare it.
18 There are, I think -- I would guess there are many
19 places in Narragansett Bay where it is higher than it
20 is in Great Bay proper. That would be accurate.

21 MR. HALL: Okay. Let's mark that as
22 Exhibit 13.

23 *(Short Exhibit 13 is marked for*

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1 *identification.*)

2 Q. The title of this paper is "Subtidal
3 Eelgrass Declines in the Great Bay Estuary, New
4 Hampshire and Maine, USA."

5 And, Dr. Short, can you tell us a
6 little bit about this paper.

7 A. Mm-hmm. The first author on this paper
8 was one of my students, and the data presented is
9 from the Great -- from the New Hampshire Port
10 Authority Mitigation and Monitoring Program. And it
11 looks at the -- essentially the biomass and the
12 structure of eelgrass beds from 2001 to 2007 -- 8, I
13 guess.

14 Q. Does this paper show that the eelgrass
15 beds are declining?

16 A. Yes.

17 Q. And can you tell me where it shows that?

18 A. Well, Figure 2 are four sites in the
19 Piscataqua River and one in Dover Point, that are all
20 showing eelgrass decline.

21 Q. Okay. Does this paper anywhere measure
22 the nutrient level or the transparency level
23 occurring over time at these sites?

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1 A. No. This is specifically looking at the
2 eelgrass data itself.

3 Q. Okay. So this paper doesn't tell me
4 what caused the eelgrass decline; it just says the
5 eelgrass declined occurred?

6 A. Correct.

7 Q. Okay. I have been curious about this
8 for quite some time, so I feel compelled to ask you a
9 couple questions about this data. And I was hopeful,
10 because you had identified it as an important paper,
11 you could give us an idea of what's going on.

12 What is the OCC site?

13 A. That's Outer Cutts Cove.

14 Q. Okay. Where is that located?

15 A. Just above the Mildred Long Bridge, the
16 lower Piscataqua.

17 Q. So that's near the mouth, towards the
18 mouth of the estuary?

19 A. No. It's right by North Mill Pond, by
20 where the Port Authority dock is.

21 Q. Okay. And can you explain something to
22 me, from Figure 2, if you have an opinion as to
23 cause.

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1 The OCC site is declining since 2001,
2 it appears, based on the line you've got drawn
3 through the data.

4 A. Mm-hmm.

5 Q. The T1 site, which is a bit north of
6 that, is also declining since 2001. But the T3 site,
7 a little further upstream, is actually increasing for
8 several years, and then it doesn't decline until --
9 it starts to decline in, say, 2004 or later. We see
10 the same thing happen at the R2 site a little further
11 upstream: that it is first increasing during the
12 period when T1 and OCC -- or decreasing, and then
13 doesn't start declining until 2004, say, in that time
14 frame. And then last but not least, Dover Point,
15 which is -- is that part of Little Bay?

16 A. It's in Little Bay, yes.

17 Q. Okay. Dover Point is increasing from
18 2003 to 2005 and doesn't start -- looks like start
19 declining, until '6 or '7. It looks to me like the
20 decline in eelgrass is working its way up the system.

21 A. Mm-hmm.

22 Q. Can you explain what's happening here?

23 A. No. It looks like it's working its way

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1 up the system. But I don't have the nutrient data.
2 We don't have -- we have almost no data in this part
3 of the Piscataqua River. PREP has no -- or DES has
4 very little data in this part of the river.

5 So it -- I mean, it's -- these -- all
6 these stations are between the Dover discharge and
7 the Portsmouth Harbor discharge. And as to why
8 they're -- we also have comparable data for this
9 time period from that -- from what's happening to
10 the deep edge of the eelgrass bed, and it basically
11 follows the same pattern.

12 Q. Do you know -- well, let me ask you,
13 just because you've said you've looked at data in the
14 system over time, which area has the best
15 transparency and the best water quality -- the
16 best -- the lowest nitrogen number and the best
17 transparency? Is it the OCC site? Or which of these
18 sites is the best water quality?

19 MS. VAN OOT: Object to the form of the
20 question.

21 Q. Do you know?

22 MS. VAN OOT: You can answer.

23 A. I guess I probably have an opinion on

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1 it, but I don't specifically know.

2 Q. Well -- and what would your opinion
3 might be?

4 MS. VAN OOT: I think that's beyond the
5 scope of the protective order.

6 MR. KINDER: What part of it?

7 MR. HALL: He cited this as one of the
8 bases for the response on the letter that was
9 sent to the coalition that was --

10 MS. VAN OOT: No, he didn't. He cited
11 it as an article that he sent at the request
12 of the City of Dover's consultant.

13 MR. HALL: No, that's not quite right.
14 The City of Dover's consultant sent a letter
15 and said, "Where's your backup information for
16 A, B, and C?"

17 MS. VAN OOT: Okay. But you're not
18 going to do an end run and ask him for
19 opinions beyond the statements that he made in
20 the e-mail. That was the court's order.

21 MR. KINDER: No, I think that -- I
22 think that --

23 MR. HALL: Well, I could go to the

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1 e-mail and show you the statement, and I could
2 ask --

3 MS. VAN OOT: You could do anything you
4 want. But I'm --

5 MR. HALL: We could argue about the
6 documents that line up with that statement.

7 MS. VAN OOT: Do you have a copy of the
8 court order?

9 MR. KINDER: Well, let's find out if he
10 has -- does he have an opinion?

11 MS. VAN OOT: He said he had an
12 opinion.

13 MR. KINDER: Oh, okay.

14 MS. VAN OOT: But my understanding of
15 the court's order was that Professor Short was
16 not going to be compelled to testify as to
17 opinions he has as an expert witness beyond
18 his observations that were the basis of his
19 e-mail --

20 MR. KINDER: Well, I think that's
21 what --

22 MS. VAN OOT: -- and his involvement
23 with respect to the -- to the 2009 criteria.

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1 MR. HALL: Let me rephrase the
2 question, and we may be able to simply avoid
3 any thought of problems.

4 BY MR. HALL:

5 Q. Dr. Short, I believe you said you're not
6 certain why this pattern of decline occurred. So
7 here's my question.

8 Comparing the DP site, which is Dover
9 Point, which is in Little Bay, compared to the OCC
10 site, which of those two sites has the lower
11 nitrogen and the better transparency level?

12 MS. VAN OOT: That's a fact question.
13 You can answer it if you -- if it --

14 THE WITNESS: A what question?

15 MS. VAN OOT: A fact question.

16 THE WITNESS: Oh.

17 MS. VAN OOT: Based on the data that's
18 shown in that exhibit.

19 THE WITNESS: Well, he's asking for the
20 cause.

21 MS. VAN OOT: All right. Well, that's
22 an opinion.

23 Q. Well, I'm just curious as to -- you

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1 know, we're seeing declines, but how were they
2 related to the water quality? Which is the essence
3 of what we're all concerned about today.

4 MS. VAN OOT: You want his opinion as
5 to how they relate to the water quality?

6 MR. HALL: No. I want to ask him which
7 one has the lower water quality -- which one
8 has the poorer water quality first.

9 MS. VAN OOT: Do you have an opinion as
10 to which one has a lower quality?

11 THE WITNESS: No. I don't think I want
12 to be quoted on that.

13 BY MR. HALL:

14 Q. Okay. You mentioned you didn't look at
15 the HydroQual response.

16 A. Mm-hmm.

17 Q. Okay. Were you present at -- strike the
18 question.

19 Do you know if the transparency levels
20 present at the time these eelgrass were declining at
21 these various sites in the Piscataqua River and down
22 to where the OCC is, do you know if the transparency
23 level was insufficient to allow for eelgrass growth?

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1 A. Yes. Not at all sites. I don't know
2 for all sites, but I do know for the Granger sites.

3 Q. Okay. Which sites was it insufficient
4 to allow for eelgrass growth?

5 A. I would have to go back and look at
6 that.

7 Q. Okay. But that's not contained in this
8 report?

9 A. No.

10 Q. Okay.

11 A. Not from -- yes, where eelgrass
12 disappears, is what it should say.

13 Q. When HydroQual looked at your report,
14 they went back -- and I'm going back to Exhibit 4 --
15 they went back, and, for each of the sites, looked at
16 the transparency level and the chlorophyll-a level
17 and the nitrogen level in each of those locations.

18 MS. VAN OOT: Is there a foundation for
19 this? He said he didn't look at the HydroQual
20 report.

21 Q. Assuming that the data is correct --

22 MS. VAN OOT: Why should he assume
23 that?

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1 A. My data or their data?

2 MR. HALL: No. Because I'm using it --
3 I'm asking him to assume that for the purpose
4 of the question.

5 MS. VAN OOT: Which is a great question
6 for an expert witness.

7 MR. LUCIC: Let him finish the question
8 first, and then --

9 MR. HALL: Yeah.

10 MS. VAN OOT: Okay.

11 BY MR. HALL:

12 Q. Assuming these data are correct, does
13 these data show that the transparency level in the
14 Piscataqua River or the OCC site is insufficient to
15 maintain acceptable eelgrass growth?

16 MS. VAN OOT: If you can answer --

17 Q. If you know the answer to that question.

18 MS. VAN OOT: -- based upon the
19 assumption you are being asked to make.

20 A. I -- I don't -- I would have to look at
21 it. I don't know enough about what this data came
22 from. I don't know.

23 Q. Okay. Assume the data are correct.

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1 Well, just by way of foundation --

2 A. Yeah, but I don't think they are, so
3 it's hard for me to make that statement.

4 Q. Well, I'll ask you to assume that they
5 are.

6 If the data are correct, is this
7 transparency level at these -- at the T3, T1, and
8 OCC site and R2 site, is that sufficiently --
9 sufficient to maintain an acceptable level of
10 eelgrass growth?

11 MS. VAN OOT: I'm going to object.

12 You're asking him for an opinion based on the
13 type of data that's generally relied on by
14 experts, and this is data that he hasn't even
15 seen and doesn't know is accurate. So I think
16 that's beyond the scope of the protective
17 order.

18 MR. KINDER: We're asking about
19 essentially an opinion that he expressed in
20 this December 22nd e-mail, which is
21 precisely --

22 MS. VAN OOT: And you can ask him about
23 that. But you can't ask him to give opinions

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1 on data that he hasn't seen or reviewed, and
2 ask him to give an expert opinion. That was
3 clearly what the court said. He said -- the
4 court said that he could be asked about the
5 statements, the factual basis for the
6 statements that he made in the e-mail. That's
7 it.

8 MR. HALL: I will rephrase it.

9 MS. VAN OOT: And I'm sure you want to
10 comply with the court's order.

11 BY MR. HALL:

12 Q. Dr. Short, did you, in indicating that
13 transparency is insufficient in Portsmouth Harbor and
14 in the -- I guess this is called the lower Piscataqua
15 River -- that transparency was insufficient in those
16 sites, did you look at DES's database of transparency
17 to see what the transparency was in those locations?

18 A. No.

19 Q. I have no further question on that.

20 MR. KINDER: Well, okay. Do you want
21 to take a break?

22 Q. Dr. Short, would you like to take a
23 five-minute break?

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1 A. Yeah.

2 Q. Okay. Thank you very much for the
3 clarification on the question.

4 *(Recess taken from 2:44 to 2:55 p.m.)*

5 *(Short Exhibit 14 is marked for*
6 *identification.)*

7 BY MR. HALL:

8 Q. Okay. Dr. Short, if we could go back on
9 the record.

10 You mentioned earlier that a number of
11 your opinions are based on some student work, in
12 particular, a particular master's thesis that has
13 relevant data in it.

14 Could you tell me the name of that
15 master's thesis?

16 MS. VAN OOT: I'm going to have to have
17 to interpose an objection here, only because
18 work done by a college student at the
19 University of New Hampshire is subject to the
20 Buckley Act amendments, and Dr. Short cannot
21 discuss anything to do with his students or
22 their papers unless they're public. I have
23 it -- I believe that's correct.

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1 A. Yeah.

2 Q. You can't tell me the name of the paper?

3 A. I probably couldn't anyway. I could
4 probably tell you the name of the student.

5 Q. Well, I don't want to know the name of
6 the student. I don't want that type of private -- so
7 you don't -- you're uncertain as to the name of the
8 paper.

9 Do you know if the paper has been
10 accepted for publication?

11 A. I know that it has not.

12 Q. Okay. Is there some on the type of
13 peer-review process, other than whoever is the
14 master's adviser on the paper, to ensure that --
15 quality-assure the data or things like that?

16 A. Yes. For a master's thesis, it's a
17 three-faculty committee that reviews it.

18 Q. Okay.

19 A. And for PhDs, it's usually five.

20 Q. It's usually five. Okay.

21 So just to recap, we don't know the
22 name of the paper. It's probably --

23 A. We're talking about multiple papers;

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1 right? Or are we talking about just one paper?

2 Q. We're talking about the one paper you
3 were referring to, the 2007-2009 paper.

4 A. Okay.

5 Q. And it's not likely to be published?

6 A. I'm hoping it will be published, yes.

7 Q. But you don't know if it will?

8 A. I don't know if it will or not.

9 Q. Okay. Is there any planned follow-up
10 research on this paper by the university at this
11 point in time?

12 MS. VAN OOT: By the university or the
13 student?

14 Q. It could be -- I'll make it general. By
15 the university.

16 A. Well, that would probably be me. But
17 since I'm leaving town, probably not.

18 Q. Probably not.

19 On the topic of leaving town --

20 A. You did it.

21 Q. No, I didn't. Hopefully not.

22 -- can you please tell us how long you
23 are going to be gone for and when do you believe you

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1 may be back? If you know.

2 A. Well, I've been here almost 30 years,
3 and I will be holding the position of seagrass
4 ecologist for the State of Washington, based in
5 Olympia, which is the capital. And I'm on a two-year
6 leave of absence from UNH. Therefore, I should be
7 back in two years.

8 Q. Okay. Well, I wish you all the best in
9 your new position and that you enjoy it out there.

10 A. Well, it's a neat opportunity, because I
11 get to work on the management side, try to solve
12 situations so they don't get to this point.

13 *(Short Exhibit 15 is marked for*
14 *identification.)*

15 Q. Okay. I am going to show you a -- it's
16 a series of e-mails. This would be Exhibit 15. And
17 these e-mails start with -- I believe you're in
18 Korea. This e-mails going from July 4, 2008, to the
19 final one on the front is November 13, 2008. These
20 e-mails all concern biomass, the reliability of the
21 biomass that are done for the eel grass maps.

22 Do you recall this series of e-mails?

23 A. I -- no. I mean, I recognize them now,

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1 but I wouldn't have remembered them if you hadn't
2 shown them to me.

3 Q. Do you recall Phil Trowbridge from New
4 Hampshire DES requesting backup information to show
5 the reliability of the biomass estimates?

6 A. Yes.

7 Q. And do you recall what your -- do you
8 recall what your response was?

9 A. No.

10 Q. Okay. Well, I'm going to read your
11 response and see if this --

12 A. Which one are you reading from?

13 Q. I'm sorry. I'm reading right on the
14 first page. It says, "As the attached e-mail
15 shows" -- and I'm right in the middle of that first
16 full paragraph that says "Al, Phil, and Steve."

17 So Philip Trowbridge back to Al Basile,
18 Phil Colarusso, and Steve Silva at EPA Region 1.

19 MS. VAN OOT: I'm sorry.

20 Q. Right here, Fred.

21 A. Okay.

22 MS. VAN OOT: It's down here.

23 A. Okay.

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1 Q. I'll just read it. "As the attached
2 e-mail --"

3 MS. VAN OOT: Can you wait a second?

4 A. Okay. I got it.

5 Q. Sure.

6 "As the attached e-mail shows,
7 Dr. Short was not able to provide the needed data.
8 Without the missing data, the planned error analysis
9 cannot be completed and DES cannot consider eelgrass
10 biomass as an indicator for the 305(b)/303(d)
11 assessments since quality assurance cannot be
12 confirmed."

13 Do you recall whether or not that's an
14 accurate statement?

15 A. I believe it is, yes.

16 Q. Okay. Do you recall whether or not you
17 were able to subsequently provide backup information
18 of quality assurance on biomass measurements to
19 Mr. Trowbridge?

20 A. I believe I did. I know we went around
21 on it a couple times.

22 Q. You believe you did. Okay.

23 And if you had a copy of what you sent

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1 to Mr. Trowbridge, that would -- we'd be able to
2 receive a copy of that?

3 A. I --

4 Q. Assuming you can find it.

5 MS. VAN OOT: Well, wait a second.

6 Again, the court order said that DES is
7 required to produce those documents in the
8 first instance.

9 Q. Do you know whether or not DES is
10 presently accepting biomass as a reliable indicator
11 of eelgrass health in the estuary?

12 A. Yes, they are.

13 Q. What's your basis for that statement?

14 A. From discussions that I had with Phil
15 Trowbridge, I believe.

16 Q. Okay.

17 A. I guess I -- I assume -- I don't know.
18 I don't know -- that's my impression.

19 Q. So that's your impression, but you're
20 not certain that it's --

21 A. I haven't talked to Phil in weeks. So I
22 don't know if -- things may have transpired since
23 then.

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1 Q. Okay. I'm going to point your attention
2 to the page 2 of that document and in the middle of
3 the first full paragraph, the sentence that starts,
4 "Since NHEP never funded the study to actually go out
5 and collect the data for this purpose, what I have
6 given you before is the result of cobbling together
7 what data I could from my historic eelgrass
8 collections."

9 Can you describe --

10 MS. VAN OOT: Want to finish the
11 sentence, just so it's accurate?

12 Q. Oh. "Not having any resources to pull
13 together a complete dataset."

14 Can you tell me what you mean by that
15 you've been cobbling together data for these
16 assessments?

17 A. Well, I've been collecting data on
18 eelgrass in Great Bay for 30 years, and biomass data
19 is a big part of what all seagrass ecologists measure
20 and -- because it's one of the more robust indicators
21 of the health of the plants. And I went through my
22 various data records and pulled out information where
23 I had both cover and biomass to come up with the

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1 best measure of -- the best method for converting
2 cover to biomass.

3 Q. Okay. Dr. Short, has anybody
4 independently checked your biomass and eelgrass
5 estimates that are done each time you go out and do a
6 mapping survey?

7 MS. VAN OOT: If you know.

8 Q. If you know.

9 A. And if I don't like the question, can
10 you restate?

11 Q. If the question is confusing.

12 A. It's confusing.

13 Q. Oh.

14 After you complete the mapping study
15 and you've estimated acreage and biomass, is there
16 anyone else that independently checks to make sure
17 that the estimates are done correctly?

18 A. Phil Trowbridge does, or his technician.

19 Q. Do you know whether or not any of your
20 recent estimates have been modified by
21 Mr. Trowbridge?

22 A. The -- what we're talking about was
23 this, relative to this e-mail, about calculating

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1 biomass from cover. And that is a constant. That
2 has not changed over time. Okay? Based on this
3 cobbled-together data, never having any funding to go
4 out and actually do it, that's what we're stuck with.

5 But -- so now your -- I can't tell if
6 you're asking about that same thing or you're asking
7 about --

8 Q. No, I'm asking about something
9 different.

10 A. That's what I thought.

11 Q. When you completed -- have there been
12 any recent reports that your eelgrass acreage
13 estimates or biomass estimates were subsequently
14 amended by --

15 A. Yes.

16 Q. Can you tell me which ones?

17 A. Probably not all of them. I know, I
18 think 2009 -- no, 2010 was. And there was another
19 year, but I don't remember which it was.

20 Q. And I suppose we'd have to get that
21 information from Mr. Trowbridge?

22 A. He could tell you that.

23 Q. Okay. These changes in biomass and

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1 acreage estimates, does this happen because of
2 something that occurred in the field or is it
3 something that occurred in a -- kind of a review of
4 the data?

5 A. It's -- it's -- no. It's something that
6 occurred in the analysis of the data, processing of
7 data. The data -- the estimates of area are
8 determined from polygons, which is done in GIS.

9 Q. Mm-hmm.

10 A. And there were -- inadvertently, there
11 were some polygon overlaps that were not removed.
12 And if two polygons overlap and both -- one polygon
13 and the other polygon counts the same value twice,
14 then you have an error. So you have an overestimate.

15 Q. Okay. So I noted that some estimates
16 had changed from the 1981 estimate of the eelgrass
17 level in Great Bay. The estimates changed from the
18 2008 impairment report to the 2009 updated eelgrass
19 impairment report. The 2008 report had the 1981
20 eelgrass acreage of Great Bay at 1,271 acres. The
21 2009 report had it as 2,130 acres.

22 Do you recall any discussions or
23 information regarding the historical eelgrass levels

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1 in 1981 and changing the number in that magnitude?

2 A. Tell me what the numbers were again.

3 Q. The original number in the 2008 report
4 was 1,271 acres --

5 MS. VAN OOT: You just said 1,281. And
6 was that from 1981?

7 MR. HALL: I'm sorry. 1271.

8 MS. VAN OOT: Okay.

9 MR. HALL: From 1981. These are both
10 in 1981.

11 Q. -- and it got changed to 2,130 acres in
12 the 2009 impairment report.

13 Do you have any recollection of the
14 number changing?

15 A. Well, from what you read there, it
16 sounds like the 2008 was Great Bay and the 2009 was
17 the Great Bay Estuary.

18 Q. No, no. It's --

19 A. That's what you said.

20 Q. No. They were both Great Bay.

21 A. I don't know that. You'd have to ask
22 Phil.

23 Q. Okay.

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1 A. That's not -- that's --

2 Q. You don't recall that --

3 A. No.

4 Q. -- that change? Okay.

5 All right. I'd like to quickly walk
6 you through a couple of the State of the Estuaries
7 reports, but I want to get an idea of when the bay
8 was determined to be eelgrass-impaired. All right?

9 MR. HALL: Here's a -- let's mark this
10 as Exhibit 16.

11 *(Short Exhibit 16 is marked for*
12 *identification.)*

13 Q. This is the 2000 State of the Estuaries
14 report, and I'd like to bring your attention to page
15 28.

16 A. Are the pages numbered?

17 Q. Page 28. They're all the way at the
18 bottom. They're a little difficult to see.

19 MS. VAN OOT: Mine's not.

20 A. I don't see any numbers.

21 Q. If you can hand it to me, I can show you
22 page 28.

23 MS. VAN OOT: Wait. Did you get mine?

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1 MR. HALL: Oh, it is very light.

2 MS. VAN OOT: Yeah. Like nonexistent.

3 MR. HALL: Makes me feel like I should
4 have stronger glasses on.

5 MS. VAN OOT: Is there a topic that we
6 could look for?

7 MR. HALL: Oh. Here it is.

8 Q. In this --

9 MS. VAN OOT: Can I wait until I find
10 the unnumbered page 28?

11 THE WITNESS: (Pointing)

12 MS. VAN OOT: Thanks.

13 BY MR. HALL:

14 Q. Do you know if in the State of the
15 Estuaries report, Great Bay was considered impaired
16 for eelgrass?

17 MS. VAN OOT: Objection to the form of
18 the question. How do you -- is there a
19 definition?

20 A. What's -- what do you mean by
21 "impaired"?

22 Q. How did you determine that eelgrass -- I
23 mean, you've been doing assessments of eelgrass

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1 impairments your whole life, haven't you, Dr. Short?

2 A. (Nodding head)

3 Q. So I'm just -- your definition of
4 "impaired" will do.

5 Does this report state that the
6 eelgrass levels in Great Bay are suffering
7 impairment?

8 A. I haven't read this, so I don't know.
9 But I don't believe it does. This is before the --
10 the impairment language is something which comes from
11 EPA, and they, I think, define it as part of
12 their . . .

13 Q. I'll read you the -- I'll just read you
14 a quote from here. The one that starts, "In the late
15 1980s, eelgrass wasting disease caused a dramatic
16 eelgrass decline in Great Bay Estuary, rousing great
17 concern into the early '90s. However, historic
18 eelgrass beds have made an impressive recovery of
19 acreage and densities."

20 Do you agree with that statement?

21 MS. VAN OOT: Well, you haven't
22 finished the statement or the paragraph.

23 Q. "And the new beds have been observed in

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1 areas previously devoid of eelgrass."

2 Do you agree with that statement?

3 MS. VAN OOT: And then there's a
4 paragraph --

5 MR. HALL: Can I just ask him my own
6 question?

7 MS. VAN OOT: Sure.

8 MR. HALL: Thank you, counselor.

9 A. Yes.

10 Q. Now, there's some statements below with
11 regard to Little Bay, right below that paragraph:
12 "While overall resource is improving, lost eelgrass
13 in Little Bay have been significantly slower to
14 recover."

15 Can you explain why -- or do you
16 know -- have you ever offered an opinion or an
17 explanation to DES or EPA why Great Bay had such a
18 significant recovery of eelgrass beds after the
19 wasting disease event but Little Bay did not?

20 MS. VAN OOT: Did you ever offer that
21 opinion? Yes or no.

22 A. I have offered it to someone. I don't
23 remember if DES was part of that. But, yeah, I have

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1 given that opinion in the past.

2 Q. Can you tell me what it is?

3 MS. VAN OOT: Well, it's beyond the
4 scope of his e-mail and the court's order.
5 But --

6 MR. HALL: He may have done it to DES.
7 He just can't remember. I'll find out from
8 Mr. Trowbridge if I can find out what the --

9 MS. VAN OOT: That's fine, but you're
10 limited --

11 THE WITNESS: It probably predates
12 Phil.

13 MS. VAN OOT: -- you're limited to the
14 statements that were set forth in his e-mail
15 in terms of his opinions.

16 A. Yeah. It came back very quickly in
17 Great Bay because it's intertidal; shallow; gets a
18 lot of light at low tide, as I've explained to you
19 before. And because with the slow onset of the
20 disease, eelgrass became more flowering, produces --
21 it's a flowering plant, produces flowers and seeds,
22 and gave it the ability with the high seed production
23 to make a very rapid comeback. At that point it was

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1 not -- the water quality was not impaired.

2 Q. So at that point the water quality,
3 shall we say the water quality -- and that's, I
4 guess, a related question I was going to have on all
5 of this.

6 The water quality at the time that this
7 regrowth occurred in Great Bay, the water quality
8 was acceptable for eelgrass growth, I take it?

9 A. Yes, I believe it was.

10 MR. HALL: Okay. All right. Let's
11 just mark -- that's already marked; right?

12 MS. VAN OOT: Which year was this
13 report?

14 MR. HALL: That was 2000.

15 MS. VAN OOT: 2000? Okay. It doesn't
16 say on it.

17 MR. HALL: I know. You have to go
18 hunting into the middle of the report to find
19 it.

20 *(Short Exhibit 17 is marked for*
21 *identification.)*

22 Q. Dr. Short, I'll show you yet another
23 report. This is the 2003 State of the Estuaries

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1 report. And I will direct your attention to page 16,
2 which the little print is down in the left-hand
3 corner which you should be able to follow.

4 It looks like this, Doctor.

5 A. 16.

6 Q. There you go.

7 What information is contained on that
8 page of the 2003 --

9 A. I haven't read it.

10 Q. Oh, I'm sorry. Please. If you could
11 take a quick look at it.

12 MS. VAN OOT: You're asking him to
13 read --

14 MR. HALL: Just to review the
15 information that's presented on that page.

16 MS. VAN OOT: Generally, I assume?

17 MR. HALL: Yeah.

18 A. Well, the graph shows eelgrass cover
19 over time, which I've collected.

20 Q. I take it this is more of the data from
21 your organization; correct?

22 A. Yes.

23 Q. Okay. And does this report indicate

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1 that the eelgrass in Great Bay are suffering
2 impairment or decline?

3 MS. VAN OOT: Objection to the form of
4 the question.

5 A. Eelgrass shows a decline through 1989,
6 and then a very rapid recovery and fairly stable
7 values through 2002, or '1.

8 Q. Yeah, it's probably 2001, I would say.

9 A. Yeah.

10 Q. So this data covers through 2001?

11 A. Mm-hmm.

12 Q. Okay. So -- okay.

13 So at this point, do you consider the
14 eelgrass beds in Great Bay impaired?

15 A. No.

16 Q. Or --

17 MS. VAN OOT: Objection.

18 Q. No?

19 Could you --

20 A. I don't.

21 Q. You don't. Thank you.

22 MS. VAN OOT: "At this point" being
23 2000 and --

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1 MR. HALL: 2001.

2 MS. VAN OOT: -- 1. Okay.

3 Q. Dr. Short, do you know what the nitrogen
4 levels were in Great Bay in 2001?

5 A. It's probably in this report, I would
6 imagine. I don't have it in memory.

7 Q. Okay. Well, let me direct your
8 attention to page 8: It's indicated at No. 3. The
9 question states, "Have nitrogen concentrations in
10 Great Bay changed significantly over time?"

11 A. Mm-hmm.

12 Q. Okay. I'm going to read you a quote
13 that's right next to the little picture of the
14 nitrogen concentrations increasing slowly over time.

15 A. Okay.

16 Q. "Despite increasing concentration of
17 nitrate/nitrite in the estuary, there have not been
18 any significant trends for the typical indicators of
19 eutrophication: Dissolved oxygen and chlorophyll-a
20 concentrations. Therefore, the load of nitrate/
21 nitrite to the bay appears to not have" -- "to have
22 not yet reached the level at which the undesirable
23 effects of eutrophication occur."

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1 Do you have any reason to disagree with
2 that statement that's contained in this State of the
3 Estuaries report? Realizing this is made for 2001.

4 MS. VAN OOT: And that you read it
5 correctly.

6 A. Yeah.

7 I think that's the interpretation that
8 was derived from this specific graph. As you well
9 know, nitrate and nitrite are not the only
10 indicators, or the only nitrogen forms present. And
11 if this were total nitrogen, it may be quite a
12 different story.

13 Q. I guess what I'm asking is, where it
14 says that there have not been any significant trends
15 for the typical indicators of eutrophication, meaning
16 poor dissolved nitrogen and increased chlorophyll-a.

17 A. Well, those are not the best indicators
18 of eutrophication, despite what they thought at that
19 time. They have become more educated since then.

20 Q. So are you telling me you disagree with
21 the statement that chlorophyll-a concentrations have
22 not been significant trends?

23 A. I don't see the chlorophyll-a

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1 concentrations given here, so I can't really say.

2 Q. Let's move on to the next one.

3 MR. HALL: This is the 2006 State of
4 the Estuaries report.

5 *(Short Exhibit 18 is marked for*
6 *identification.)*

7 Q. All right. I'd like to draw your
8 attention to page 20 and 21.

9 Okay. On page 20 there's some text,
10 and on page 21 I take it is another one of your
11 eelgrass acreage and biomass graphs?

12 A. It's not my graph, but it is my --
13 derived from my data.

14 Q. Oh. Do you know who puts together these
15 graphs?

16 A. Whoever was the technician before Phil,
17 I think. I don't know who did that.

18 Q. This report discusses some -- on page
19 20, some decline in eelgrass coverage.

20 MS. VAN OOT: Is that a question?

21 MR. HALL: No, I'm just making an
22 observation.

23 Q. But it says something about it in the

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1 second column, and I was going to ask you whether or
2 not you -- at this point in time, you -- well,
3 actually, let me back up.

4 Did you have input on the text of this
5 report?

6 A. I don't know. I haven't read it lately.
7 I had input -- I had some input to the report, and I
8 don't know if I specifically got to review this or
9 not.

10 Q. Okay.

11 MS. VAN OOT: The 2006 report?

12 THE WITNESS: 2006.

13 Q. You know, I'm going to pass on questions
14 on this report for now.

15 With regard to the eelgrass health in
16 Great Bay in the mid-'90s, can you -- did you
17 observe at that time whether macroalgae growth was
18 excessive in the mid-'90s and did it interfere with
19 eelgrass growth in Great Bay?

20 A. The mid-'90s? I don't remember
21 specifically the mid-'90s.

22 Q. I'm sorry?

23 A. I don't remember what the macroalgal

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1 populations looked like in the mid-'90s.

2 Q. Who was primarily -- were you
3 responsible for looking at macroalgae --

4 A. No.

5 Q. -- or was that another researcher?

6 A. No one was.

7 Q. No one was. Okay.

8 But the eelgrass rebounded in the
9 mid-'90s; right? To a --

10 A. In the early '90s it rebounded.

11 Q. In the early '90s?

12 A. Yeah.

13 Q. And would the macroalgae -- I guess the
14 macroalgae didn't prevent the eelgrass from
15 declining?

16 A. Well, the decline, if you remember, was
17 from wasting disease.

18 Q. Ah. Yes.

19 A. And it rebounded from wasting disease.
20 And my guess is that's the time period when
21 macroalgae was beginning to show up in the estuary.

22 MS. VAN OOT: You're not obliged to
23 guess here.

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1 THE WITNESS: Oh, I thought I could
2 guess. All right. I tend to guess.

3 MR. HALL: Is counsel directing --
4 telling him not to guess?

5 MS. VAN OOT: No. Do not guess.

6 MR. HALL: The record will reflect that
7 Dr. Short guessed and he's not supposed to.

8 Why don't --

9 MS. VAN OOT: That should have been
10 part of the instructions; right? He's not
11 obliged to speculate or guess. To the best of
12 his knowledge.

13 Q. I'd like to look at this 2008 report on
14 eelgrass quality. It covers eelgrass impairments.

15 MR. HALL: This is Exhibit 19.

16 *(Short Exhibit 19 is marked for*
17 *identification.)*

18 Q. Dr. Short, can you tell me whether or
19 not you recall if you were involved in the
20 discussions and development of this report assessing
21 eelgrass health throughout the entire estuary?

22 A. Can you read the title.

23 Q. The title is "Methodology and Assessment

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1 of Results Related to Eelgrass and Nitrogen in Great
2 Bay Estuary for Compliance with Water Quality
3 Standards for the New Hampshire 2008 Section 303(d)
4 List."

5 A. I think I did edit -- have input as
6 well.

7 Q. Okay. Could I direct your attention to
8 page 9, and it's -- page 9 through page -- oh, let's
9 keep going -- to page 14, to page 15 is basically a
10 historical rendition of what happened in various
11 sections of Great Bay and when the various occasions
12 of wasting disease occurred and how the estuary
13 responded.

14 Do you know who prepared this history?

15 A. Not without reading it, no.

16 Q. Do you recall whether or not you
17 provided assistance on providing the history?

18 A. Well, I'm not an author on it.

19 Q. Okay.

20 A. And I don't know if they actually used
21 my data or not. If they did use some of my data.

22 Q. I'm going to direct your attention to
23 page -- on Great Bay. It's on page 12. And I'm

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1 going to read you a sentence from it, and then I'm
2 going to show you a table that was developed. It
3 says, "Linear regression of eelgrass cover from
4 1990-2005 did not detect a significant trend at the
5 0.05 significant level. The trend was evaluated for
6 the 1990-2005 period because the eelgrass populations
7 in the estuary --"

8 MS. VAN OOT: "Whole estuary."

9 Q. "-- in the whole estuary were devastated
10 in 1988-1989 due to an infestation of slime mold."

11 MS. VAN OOT: Go ahead and pronounce
12 it.

13 Q. Then I'm going to skip a sentence or two
14 and just go to the punchline: "Great Bay should not
15 be considered impaired for significant eelgrass
16 loss."

17 Do you recall having -- and this is
18 2008 when they're making this statement. I'll show
19 you the date it was based on.

20 Do you recall having any input into
21 this conclusion as to whether Great Bay was impaired
22 for eelgrass?

23 A. No, I do not remember being asked for

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1 input to that.

2 Q. Okay. Do you --

3 A. It should be listed as threatened, it
4 says.

5 Q. Yeah, should be listed as threatened.
6 It's not impaired. It's threatened.

7 A. Yeah, I -- again, that's -- well, I
8 mean, We should probably correct some definitions
9 here.

10 Q. Please.

11 A. "Impaired" is the impairment of the
12 estuary, which is how EPA uses it. I mean, as far as
13 I know, the only one who has talked about impairment
14 of eelgrass is you.

15 Q. No, actually, I could direct you to
16 page -- Table 2 in the back of the document at page
17 26 where they do impairment, river by river by river
18 and section by section of the estuary, and they make
19 individual findings of whether or not something is
20 impaired or not.

21 A. What page?

22 Q. Well, if you -- let me -- I'll get it
23 for you quickly. It's page 26. It's Table 2.

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1 A. I don't think I have that.

2 MS. VAN OOT: His point was "impairment
3 of estuary" as opposed to "impairment of
4 eelgrass."

5 Q. Here's the table. What they do is go
6 section -- the Winnicut River.

7 A. Right.

8 Q. And they say, "Significant decrease:
9 Yes." "Listing: Impaired."

10 "Squamscott River, Percent Change: 100
11 percent loss."

12 A. "Impairment" is impairment of the
13 estuary --

14 MS. VAN OOT: Not the eelgrass.

15 A. -- not the eelgrass.

16 Q. No, it's -- well, I --

17 A. I mean, that's pretty standard how EPA
18 uses that terminology.

19 Q. What does "impairment of estuary" mean?

20 A. There's no eelgrass in the Squamscott.
21 So impaired -- you wouldn't say the eelgrass is
22 impaired, because it's not there.

23 Q. No.

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1 A. "Impaired" means that the estuary is
2 impaired and it will no longer support eelgrass.

3 MR. HALL: Okay. Well, let the record
4 reflect that Dr. Short has a definition of
5 what he believes impaired is. I'm asking him
6 about questions as to whether or not various
7 segments of the estuary were considered
8 impaired due to eelgrass loss.

9 Q. Looking at Table 2, Dr. Short, is the
10 Great Bay Estuary listed as impaired for eelgrass?

11 A. Well, the Great Bay Estuary isn't
12 listed.

13 Q. Hmm?

14 A. This is -- this is all the different
15 components of the estuary, and some are impaired and
16 some are not impaired.

17 Q. Right. And when you go under the column
18 for Great Bay --

19 A. Great Bay --

20 Q. -- does it say it's impaired?

21 A. That's not just Great Bay Estuary. It's
22 not the whole thing.

23 Q. Oh, right. Just Great Bay.

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1 A. Okay. Well, you said "estuary."

2 Q. Oh, did I?

3 A. Yeah.

4 Q. Oh, I apologize if I used the word
5 "estuary."

6 A. Okay. It is confusing.

7 Q. I should have said it is in Great Bay.

8 A. Yeah.

9 Q. And does that -- consistent with the
10 language you read before, does that indicate
11 Great Bay is impaired?

12 A. Well, impaired is a -- is something
13 which really has degrees of impairment, and it's not
14 just nonimpaired and impaired. They obviously have
15 some criteria they're using to say that if it's at
16 some level, then it's impaired. I think 68 percent
17 change would be impaired.

18 Q. That was a 68 percent increase,
19 Dr. Short, not a decrease.

20 A. Are you sure?

21 Q. Yes.

22 A. Oh, yeah. Okay. Oh, that's the 2003 to
23 '5.

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1 No, it's not impaired, then.

2 Q. Okay. And it says it's not impaired up
3 through -- what's the last year they took data there?

4 A. 2005.

5 Q. 2005. Do you know --

6 A. Because that -- okay. That's going
7 back -- but that's -- yeah. Okay.

8 Sorry. Go ahead.

9 Q. So we're both understanding this as not
10 impaired, looking at data through 2005?

11 A. Well, only looking at three years:
12 2003, 2004, 2005.

13 Q. Right.

14 A. And it's just looking at too short a
15 dataset to make any real decision, in my viewpoint.
16 I mean, you could pick three points that all show an
17 increase, or you could go back further to include '96
18 and it would show a decrease. So . . .

19 Q. To your knowledge, is 1996 the mark by
20 which any impairments of eelgrass must be determined?

21 A. I think '96 is the most extensive
22 eelgrass I ever found in the Great Bay. So that's --

23 Q. Right. Well, using that as --

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1 A. And it is also the closest to what we've
2 put together as a historical distribution.

3 Q. Well, the historical distribution is
4 listed up at the top for 1980-'81. That's the
5 1,217 acres.

6 A. That's not the actual historical.

7 Q. That's not?

8 A. That's 1981. No. This is recorded back
9 to '48.

10 Q. And there was more eelgrass in 1948 than
11 there was in 2005?

12 A. I don't know. Doesn't look like it,
13 according to this. But that wasn't -- this is --
14 this was done, when? 2008.

15 Q. 2008.

16 On these various tidal rivers, they
17 have a little write-up. And I'll direct your
18 attention back to page 11, please, if you could.

19 MS. VAN OOT: Exhibit 19?

20 MR. HALL: We're still on the same
21 exhibit.

22 Q. For each of these tidal river -- before
23 I ask that question -- I'm sorry. Strike that.

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1 Do you know what the nitrogen and
2 transparency level was in the 2004-2005 time frame
3 in Great Bay?

4 A. I mean, can I give you a number right
5 now?

6 Q. Was it recorded?

7 A. I didn't record it.

8 Q. Okay. So -- okay.

9 When you look at the tidal rivers on
10 each of these sections, they each talk about the
11 historic maps do not show eelgrass -- for example,
12 Winnicut. "Historic maps do not show eelgrass
13 cover." And then they talk about wasting disease.

14 In each one of these tidal rivers --
15 and I could walk you through each one, but I'll ask
16 you first for your recollection and maybe we can
17 avoid that. In each one, they say, the present
18 acres is basically zero. Squamscott. Lamprey.
19 Oyster. I guess the Bellamy was doing a little bit
20 better. And they each say the eelgrass coverage is
21 the loss -- the cause of eelgrass loss is unknown.

22 Is that an accurate statement, that --

23 A. Presumably they didn't know or they

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1 would have said so.

2 Q. Okay.

3 A. It doesn't mean it's not unknown by
4 anyone.

5 Q. Ah. Well, let me ask the question,
6 since you are the eelgrass expert.

7 A. Well, they didn't ask me, obviously.

8 Q. And would you have told them that the
9 cause of eelgrass loss in the Squamscott River is
10 known?

11 A. For the Squamscott specifically?

12 Q. Yeah. How it lost all its eelgrass.

13 A. Yes, I would.

14 MS. VAN OOT: Okay.

15 Q. And what would you have said that the
16 Squamscott -- was the cause of the eelgrass loss in
17 the Squamscott?

18 A. The eutrophication of the Squamscott
19 river.

20 Q. And what would you base that on?

21 A. Discussions with Mr. Chapman, who used
22 to run the boat launch ramp at Chapman's Landing in
23 the early '80s, mid-'80s. I talked to him, and he

MR. HALL: Oh, I'm sorry. Well, let me

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1 finish.

2 MS. VAN OOT: -- to read from the
3 report that he said he didn't contribute to or
4 doesn't think he contributed to?

5 MR. HALL: No. I'm asking him why
6 there's a loss of eelgrass in every one of
7 these rivers, and every one of these says the
8 loss is unknown, including the Bellamy. "The
9 cause of the eelgrass loss is unknown." I'm
10 reading on page 12. Oyster River. "The cause
11 of the eelgrass loss is unknown."

12 Q. Dr. Short, do you know the cause of the
13 eelgrass loss in each of these rivers?

14 MS. VAN OOT: Are you asking for an
15 opinion? That's beyond the scope of his
16 December 22nd e-mail. I'm going to --

17 MR. HALL: No, he said he participated
18 in -- with DES in these impairment reports. I
19 don't know to what degree.

20 MS. VAN OOT: But you're asking him
21 about a specific section of the 2008 report,
22 which he said he doesn't know who did the
23 historical summary that appears at pages 9

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1 through 15.

2 So if you're asking him to read from
3 the report, fine; he can do that. But you're
4 not going to ask him his opinions as to
5 statements that are made in that report. I've
6 let you go for a while on it, but I think it's
7 well beyond the scope of the protective order.

8 MR. HALL: All right. Well, let's
9 clarify --

10 MS. VAN OOT: And you're better off
11 asking the people that prepared the report.

12 MR. HALL: Well, let's clarify this for
13 the record, just so I -- there's no mistake on
14 this.

15 BY MR. HALL:

16 Q. Dr. Short, did you participate in any of
17 the writeups for the descriptions of when and why
18 eelgrass were lost for the Winnicut? the Squamscott?
19 the Lamprey? the Oyster? the Bellamy?

20 A. I don't know if I contributed to
21 these -- to this specific report. I did give them
22 some input on eelgrass in the Great Bay Estuary, but
23 this -- I would not have written these, so I

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1 obviously didn't get to edit them.

2 Q. Okay. So, I mean, I'll just say this as
3 a -- consequently, you don't know if changing
4 nitrogen levels then caused significant changes in
5 eelgrass losses in these areas?

6 MS. VAN OOT: Based on the information
7 or data that's set forth at pages 9 through
8 15?

9 MR. HALL: No. I'm just asking since
10 he says he's been looking at this for 30
11 years.

12 MS. VAN OOT: And if you're asking him
13 on what he's been looking at for 30 years,
14 you're asking him for his expert opinion as to
15 the cause.

16 MR. KINDER: That's what -- I'd just
17 like to point out that that's what his
18 December 22nd letter read of he said, and
19 that's directly what Judge McNamara said we
20 can ask him about.

21 MS. VAN OOT: You can ask him about it
22 with respect to the statements in his report
23 based upon his observations. That's what

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1 Judge McNamara said. Judge McNamara did not
2 say you could examine him on reports prepared
3 by other experts, which is the type of
4 information that's relied upon by an expert
5 who has been retained to prepare a report in
6 the case.

7 MR. KINDER: Well, we don't accept
8 that. But can I suggest --

9 MS. VAN OOT: I understood you don't
10 accept it, Tupper, but that's what the court's
11 order is. I've got it here.

12 MR. KINDER: The court's order says we
13 can ask him about the extent to which he --
14 what the background is for his opinion that
15 these areas of the Great Bay Estuary are
16 impaired because of nutrients causing --

17 MS. VAN OOT: Hang on.

18 MR. KINDER: -- causing transparency
19 problems.

20 MR. HALL: I could just ask him the
21 question related to the exact statement that's
22 contained in the December 22nd letter.

23 MS. VAN OOT: Which is fine, and I said

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1 you could do that all along.

2 MR. HALL: Well, let's do that.

3 MS. VAN OOT: So ask him what the basis
4 for the statements are. You've already asked
5 him, but you could ask him again.

6 MR. HALL: Okay.

7 BY MR. HALL:

8 Q. Dr. Short, back to Exhibit 1, and I'll
9 just read it: "My long-term research and annual
10 monitoring of eelgrass in the estuary have clearly
11 demonstrated that eelgrass is disappearing from the
12 estuary due to excessive algal growth caused by
13 increasing nitrogen levels in the water."

14 And I'm going to ask you whether or not
15 you've got research showing that for the Squamscott
16 River.

17 MS. VAN OOT: That's a yes-or-no
18 question. Do you have research?

19 Q. Do you have research showing that that
20 statement is true for the Squamscott River?

21 MS. VAN OOT: Which is not specifically
22 mentioned in this December 22nd, but that's
23 all right.

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1 A. What was the time frame on that?

2 Q. It doesn't say what the time frame is.

3 It just says, "My long-term research and annual
4 monitoring," and it doesn't say -- it says "from the
5 estuary."

6 So I'm trying to narrow down, which
7 parts of the estuary do you actually have research
8 and long-term monitoring associated with to support
9 this statement? Do you have that support for that
10 statement from your research for the Squamscott
11 River?

12 A. I have -- I have knowledge of conditions
13 in the Squamscott River from some of the previous
14 information that I told you about, my earlier studies
15 in the Squamscott River in -- I think it was in the
16 '80s. And I didn't rely on them to make that
17 statement, but they may be contributing to my
18 background knowledge of that.

19 Q. Well, let's get a clarification, then.

20 Have you done long-term research and
21 annual monitoring in the Squamscott River? Yes or
22 no.

23 A. Well, that's two questions. Ask one or

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1 the other. Long-term monitoring and --

2 Q. It says, "My long-term research and
3 annual monitoring."

4 A. Long-term research is different than
5 annual monitoring. So they're talking about two
6 different things here. Which one do you want to know
7 about?

8 Q. Well, it says "my long-term research."
9 I'm not talking about anybody else's --

10 A. Okay. That's fine. And --

11 Q. -- research for the Squamscott River.

12 A. Mm-hmm.

13 Q. Do you have -- have you done long-term
14 research and annual monitoring for the Squamscott
15 River?

16 MS. VAN OOT: Both or either?

17 MR. HALL: Either.

18 A. Yes.

19 Q. When?

20 MS. VAN OOT: Which?

21 A. Which is first. I've not done long --
22 I've not done long-term monitoring in the Squamscott
23 River. I have done some research and observational

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1 information on the Squamscott River, and it dates
2 back to my work in the '80s.

3 Q. The Lamprey River. Have you done
4 long-term research on the Lamprey River?

5 A. No.

6 Q. What about annual monitoring?

7 A. No.

8 Q. The Oyster River?

9 A. But there is long-term monitoring done
10 on the Lamprey River. Not mine, but --

11 Q. For eelgrass and nitrogen and algal
12 growth?

13 A. No, you didn't ask about eelgrass and
14 nitrogen and algal growth.

15 Q. Well, this is what it's all about.

16 A. Well, I mean, here we are.

17 Q. I'm not asking you whether you did the
18 research on -- you know, on gumdrops. I mean, it's
19 all related to the point.

20 MS. VAN OOT: If you finish the
21 question, it might put it in context.

22 A. So tell me what the question is that
23 you're asking about. That's not this.

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1 Q. No.

2 A. You had me in here, and now you've gone
3 back to something else again.

4 Q. That's because your counsel objected to
5 asking any general questions about a document that
6 you --

7 MS. VAN OOT: Your counsel objected on
8 the basis of a court order. Okay?

9 Q. The document that I'm taking this
10 statement from is Exhibit 1. And now I'm going
11 through -- this is the e-mail that you sent to Steve
12 Perkins. So I'm trying to understand --

13 MS. VAN OOT: Let me get a copy of that
14 in front of you.

15 THE WITNESS: I don't have it.

16 Q. -- where in the estuary --

17 THE WITNESS: It's 2. I have 2.

18 MS. VAN OOT: All right.

19 A. And you're on the first page, the first
20 paragraph?

21 Q. Yeah. Where it says, "My long-term
22 research and annual monitoring of eelgrass in the
23 estuary has clearly demonstrated that eelgrass is

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1 disappearing from the estuary" -- as a whole -- "due
2 to excess algal growth caused by increased nitrogen
3 levels in the water."

4 A. Mm-hmm.

5 Q. So I am trying to find out whether or
6 not you did long-term research and annual monitoring
7 in these various subsections of the estuary.

8 A. Ah.

9 Q. Okay. Does that help clarify the
10 question?

11 A. It does.

12 Q. Okay. Thank you.

13 With regard to that statement, the
14 Squamscott River, does that statement regarding your
15 long-term research and monitoring apply to the
16 Squamscott?

17 A. Yes.

18 Q. Okay. And when have you been doing
19 research on the Squamscott?

20 A. Oh, off and on since I've been here.

21 Q. Okay. And this research was presented
22 to --

23 A. It's never been presented to anyone.

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1 Q. Never been presented to anyone?

2 A. Well, it was presented to -- some of it
3 was presented to -- who headed that up? The Nature
4 Conservancy, when they did the Great Bay compendium.

5 Q. Presented to DES?

6 A. I don't think so.

7 Q. Okay.

8 Lamprey River?

9 MS. VAN OOT: Question?

10 Q. Long-term research and monitoring on the
11 Lamprey River?

12 A. No.

13 Q. No.

14 Oyster River, long-term research and
15 monitoring there?

16 A. Yes.

17 Q. And what's the nature of that long-term
18 research and monitoring?

19 A. Eelgrass observations.

20 Q. Eelgrass observations, but --

21 A. Since --

22 Q. -- did you have -- have you been
23 monitoring algal growth and increased nitrogen levels

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1 with that eelgrass monitoring?

2 A. No.

3 Q. Okay.

4 A. I mean, this statement doesn't say I did
5 all these things in all these places, at every time.

6 And it doesn't even say --

7 Q. Oh. So you --

8 A. -- whether "long-term" is two points in
9 time or "long-term" is 10 years. I mean, you're
10 trying to sort of nitpick this down and weasel it
11 down to some little, you know, specifics.

12 But it's a general statement that I've
13 been in the estuary for 30 years. I've seen the
14 color of the water change. I've seen the turbidity
15 levels change. I've seen the occurrence of plankton
16 populations increase. You know? And this was a
17 general statement reflecting that.

18 Q. Have you been presented with data
19 showing that algal levels have very little to do with
20 water column transparency occurring in the tidal
21 rivers?

22 A. By who?

23 Q. HydroQual.

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1 A. I don't know that I've seen that.
2 Unless -- actually, I -- I may have. It may have
3 been at one of the meetings that you presented at,
4 or --

5 Q. I see.

6 I would just show you a couple of these
7 exhibits, Dr. Short, to go over this question of
8 whether or not that I -- I realize you are now
9 explaining to me that this is a very general
10 statement on page 1.

11 A. I think that, yes. It is.

12 Q. We're all trying to figure out what
13 you're saying and what you're not.

14 A. Okay.

15 MR. HALL: Let's mark this as Exhibit
16 20. This is data on the Squamscott River with
17 transparency level versus chlorophyll-a.

18 MS. VAN OOT: And the source of this
19 document?

20 MR. HALL: This document was submitted
21 as part of the comments at the Great Bay
22 Coalition on the Exeter permit. The data is
23 generated from DES's database provided by Phil

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1 Trowbridge.

2 MS. VAN OOT: And provided by whom?

3 MR. HALL: Provided by Phil Trowbridge
4 to HydroQual.

5 MS. VAN OOT: All right. So this is
6 part of the HydroQual analysis?

7 MR. HALL: Part of the HydroQual
8 analysis.

9 MS. VAN OOT: Okay. Do you want to
10 determine whether or not the witness has seen
11 this particular data?

12 BY MR. HALL:

13 Q. Have you seen that particular document
14 before, or that particular analysis before,
15 Dr. Short?

16 A. I'm not sure. There's been a lot of
17 them, so I have to look at them. This is --

18 Q. This is actually Kd. This is the actual
19 transparency measurement that you would use to
20 implement the transparency.

21 A. Kd is the extinction coefficient.

22 Q. Yeah, extinction coefficient.

23 MS. VAN OOT: So you're just being

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1 asked if you've seen it.

2 A. I don't recall having seen it.

3 Q. Okay. Let's -- you don't recall having
4 seen it? Okay. Fine.

5 MR. HALL: Let's mark that as Exhibit
6 20.

7 *(Short Exhibit 20 is marked for*
8 *identification.)*

9 MR. HALL: Then we're going to go for
10 Exhibit 21. It's the same type of analysis on
11 the Lamprey River. This was presented at the
12 Newmarket public hearing. The same source of
13 the data, DES.

14 *(Short Exhibit 21 is marked for*
15 *identification.)*

16 Q. Dr. Short, did you attend the Newmarket
17 public hearing?

18 A. I did, yes.

19 Q. Okay. Do you recall seeing this data
20 presented at the hearing?

21 A. I don't remember it, but I believe it
22 was presented.

23 Q. Okay.

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1 A. If you say it was.

2 MS. VAN OOT: Well, you don't have to
3 remember it because he said it.

4 THE WITNESS: Oh, yeah. That's true.

5 A. I don't remember.

6 What's the source of the data?

7 Q. DES.

8 A. What time periods?

9 Q. Over 2000 to 2008. The entire record
10 that they have.

11 MS. VAN OOT: There's nothing that
12 shows that.

13 A. So what was the Kd calculated from, the
14 extinction coefficient?

15 Q. No. From actual measurements with
16 the -- field measurements with a probe.

17 A. No, I'm not aware of this data.

18 Q. Okay. And I'll show you one last one,
19 Dr. Short. It's the Piscataqua River. This was
20 presented at the Dover hearing.

21 Were you present at the Dover hearing?

22 A. Yes.

23 Q. Okay. Do you recall HydroQual doing a

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1 presentation and myself doing a presentation
2 regarding the datasets there?

3 A. I missed yours, but I think I saw --

4 Q. Saw the HydroQual one?

5 A. Yes.

6 *(Short Exhibit 22 is marked for*
7 *identification.)*

8 Q. Do you recall seeing this analysis,
9 Dr. Short?

10 A. Well, Tom presented an awful lot of data
11 that night at the meeting, and I don't specifically
12 remember this one.

13 Q. Regarding these graphs, which show
14 eelgrass -- I'm sorry -- which show an extinction
15 coefficient and then the effect of chlorophyll on
16 that extinction coefficient, had you ever done
17 analyses like these yourself?

18 A. Yes.

19 Q. And what did it show?

20 A. It shows that, under some circumstances,
21 extinction is related to chlorophyll and sometimes it
22 isn't.

23 Q. Did it show the same type of analysis as

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1 these, that the vast majority of time, extinction has
2 got very little relationship to chlorophyll level?

3 A. No.

4 Q. Okay. And --

5 A. The problem with all this DES data is
6 it's just single points in time, you know. It's
7 not -- there's no integrated monitoring of the --
8 those conditions. So it's -- it's -- it may be a
9 fine analysis, but it's on very flawed data.

10 Q. And do you have better data, less flawed
11 data than DES?

12 A. I have better observations than DES.

13 Q. Did you provide them to DES?

14 A. They're not in a numeric format.
15 They're qualitative observations.

16 Q. Can you explain "qualitative
17 observations"?

18 A. Yeah. When you swim in the bay and it
19 looks green instead of blue, it means that there's
20 phytoplankton in the water.

21 Q. Right. And if --

22 A. And there's been a progressive change in
23 the Piscataqua. Well, in the Piscataqua at the Dover

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1 Bridge.

2 Q. All right. And how frequently do you
3 swim in the bay?

4 A. Usually two or three times a year.

5 Q. Did you ever try to calibrate your view
6 or understanding of green and blue to the
7 chlorophyll-a data contemporaneously taken by the
8 State, if such data were available?

9 A. No, I don't think so.

10 Q. You said you swim in the bay two or
11 three times --

12 A. Well, that's more than swim. I'm
13 actually scuba diving.

14 Q. Oh. I'm sorry. You scuba-dive two or
15 three times a year.

16 Do you know how many data points those
17 are? Are those more than two to three data points
18 per year?

19 A. Per year, I don't know, but I don't
20 suspect so. I think it's only a few points a year.

21 No, actually, it may be -- it may be,
22 like, one data point a month.

23 Q. So if this were based on data that were

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1 on the order of 12 to 15 data points a year, compared
2 to two to three observations a year, which analysis
3 do you think is more reliable?

4 MS. VAN OOT: Objection. That's
5 opinion.

6 THE WITNESS: I don't -- I shouldn't
7 answer that?

8 MR. KINDER: This goes right to his
9 December 22nd thing. He says, "My
10 observations led me to the opinion that, you
11 know, there's all this causal relationship."

12 MS. VAN OOT: Show me in -- show me --

13 A. Except that the difference is that these
14 data are out there, pulling out, taking a sample, and
15 going away. And I'm there for four hours, five
16 hours, in the water, out of the water, different
17 spots in the river. So I see what happens when the
18 tide changes. I see what happens when the system --
19 so it is different. It's more -- it's far closer to
20 a continuous monitoring than it is -- I mean, it's
21 short-term, but you see that -- you see the changes
22 in the system.

23 You can laugh. It's all right.

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1 Q. I'm not -- I'm just suggesting --

2 A. How many times have you been in the
3 Piscataqua?

4 Q. Actually, sir, other than being in a
5 boat, which was extraordinarily enjoyable, I haven't.
6 But I do know something about monitoring and modeling
7 programs, and usually the more data you have, the
8 more likely your answer is going to be correct.

9 MS. VAN OOT: Good. Then you can
10 testify to that.

11 Q. I'd like to ask you a question
12 Dr. Short, about restoration of eelgrass. And have
13 you done --

14 MS. VAN OOT: Which specific statement
15 does that refer to now in the December 22nd
16 e-mail?

17 MR. KINDER: Why don't you find out
18 what the question is first.

19 MS. VAN OOT: Well --

20 Q. Have you provided advice to DES
21 regarding restoration of eelgrass?

22 A. Are we talking about this?

23 Q. No. Jim will.

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1 A. Advice I've given, yes.

2 Q. Yes. Okay.

3 Did you prepare these graphs, or have a
4 role in preparing these graphs, which is Exhibit 23,
5 which identify the areas of Great Bay where eelgrass
6 restoration is more suitable as to habitat?

7 A. Yes.

8 *(Short Exhibit 23 is marked for*
9 *identification.)*

10 Q. And I'd like you to look at the tidal
11 rivers for Lamprey and Squamscott.

12 A. Mm-hmm.

13 Q. Does that indicate that eelgrass
14 restoration is suitable in those areas?

15 A. No. Unsuitable.

16 Q. Can you explain to me why?

17 A. The water quality isn't good enough.

18 Q. Okay. What factors of the water quality
19 are preventing it?

20 A. I haven't specifically analyzed that,
21 but I suspect it's all those related with nutrient
22 inputs and runoff.

23 Q. Do you know whether or not the turbidity

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1 level and the color level in the Squamscott and
2 Lamprey River, all by themselves, even if there was
3 no algal growth in those waters whatsoever, do you
4 know if that's sufficient to prevent the eelgrass
5 growth in those water bodies?

6 MS. VAN OOT: Are you continuing to ask
7 him about advice he provided to DES?

8 MR. HALL: Yes.

9 MS. VAN OOT: Did you provide that
10 advice to DES?

11 THE WITNESS: No.

12 Q. Which advice did you not provide to DES?

13 A. Anything about the nature of the
14 decreased water clarity in the two rivers.

15 Q. In those two rivers?

16 A. Yes.

17 Q. Did you advise DES that it was necessary
18 to attain the 0.3 nitrogen standard in the Squamscott
19 or Lamprey River to ensure eelgrass restoration?

20 MS. VAN OOT: It's a yes-or-no
21 question.

22 A. No.

23 Q. Okay.

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1 MR. HALL: Would you mind taking a
2 break for five minutes?

3 MS. VAN OOT: Sure. We're running into
4 some time limits, but --

5 MR. HALL: That's what we're trying to
6 make sure we don't.

7 MS. VAN OOT: Okay. So 4:30?

8 MR. HALL: We'll probably end up going
9 to 4:45, I think, based on the little
10 wrangling and back-and-forth, but it shouldn't
11 be any later than that.

12 MS. VAN OOT: Well, I object to the
13 characterization of my objections as
14 "wrangling." You didn't engage.

15 MR. HALL: It's offered in the most
16 collegial of ways.

17 *(Recess taken from 4:05 to 4:11 p.m.)*

18 MR. HALL: That's going to be 24.

19 *(Short Exhibit 24 is marked for*
20 *identification.)*

21 BY MR. HALL:

22 Q. Back on the record.

23 Dr. Short, you mentioned at the very

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1 beginning of your deposition that you were involved
2 in the Technical Advisory Committee that the New
3 Hampshire Estuaries Project conducted.

4 Can you please tell us what your role
5 was in that committee?

6 A. I was an adviser like everyone else.

7 Q. And what did that entail?

8 A. Attending meetings, talking over all the
9 issues that went into the estuary program, and
10 commenting on issues as they came up, and reviewing
11 documents.

12 Q. Reviewing technical presentations that
13 were done?

14 A. Not reviewing them, but seeing them.

15 Q. Seeing them?

16 A. Yeah.

17 Q. Very good. Okay.

18 I'd like to ask you some questions
19 regarding these meeting minutes. Were you -- or I
20 guess the first of these meeting minutes is
21 September 20, 2005, that we've got here.

22 MS. VAN OOT: Are these in
23 chronological order?

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1 MR. HALL: They are in chronological
2 order.

3 MS. VAN OOT: So they go from
4 September 30, 2005, to November 17, 2008?

5 MR. HALL: To November 17, 2008. That
6 is correct.

7 Q. It says here that EPA presented -- and
8 I'm looking under Bullet Point No. 2 on the first
9 page -- presented the federal mandate for developing
10 nutrient criteria for estuaries.

11 Was it your understanding as part of
12 this advisory committee that the State was mandated
13 to adopt numeric nutrient criteria?

14 A. At that point in 2005, I don't remember.

15 Q. Do you recall Matt Liebman's
16 presentation at all?

17 A. Where is that? I don't see a reference.

18 MS. VAN OOT: Paragraph two. The
19 question is simply do you remember it.

20 A. No, I don't remember.

21 Q. Was one of the purposes of the Technical
22 Advisory Committee to give advice on the development
23 of numeric nutrient criteria?

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1 A. No, I don't believe so.

2 Q. I'd like you to look at the June 15,
3 2006, minutes. You were present at that meeting
4 also, when you go to the middle of the page, the one
5 with the highlights on it.

6 Do you recall that there was a
7 discussion on the need to develop empirical
8 relationships between light attenuation, turbidity,
9 TSS, and chlorophyll, as it relates to eelgrass in
10 the estuary?

11 A. Is that the first yellow mark?

12 Q. Yeah, that's the first one. Under
13 "Water Clarity Indicators."

14 MS. VAN OOT: What?

15 A. Under linkage? Linkage between them?

16 Q. No. It's on the prior page. Or maybe
17 the pages are reversed.

18 MS. VAN OOT: No.

19 MR. HALL: One, two, three -- no, a
20 little bit after that. There.

21 MS. VAN OOT: Okay. That's not on page
22 4.

23 MR. HALL: Yeah, that would be page --

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1 I guess mine is out of order.

2 Q. Do you recall the discussion regarding
3 the need to develop an empirical relationship between
4 light attenuation, turbidity, TSS, chlorophyll-a, and
5 eelgrass?

6 A. I remember discussing the issue.

7 Q. Okay.

8 A. Not that we needed to develop a
9 relationship or not, but what was out there.

10 Q. Okay. Let's go back on the linkage
11 statement on that prior page, on page 3. They talk
12 about the group had this discussion. They say, "Data
13 presented show increasing nitrogen concentration and
14 eelgrass, but do not show a strong linkage between
15 increasing nitrogen and decreasing water clarity."

16 A. Mm-hmm.

17 Q. Do you recall what presentation was done
18 to make that in support of this statement?

19 A. No.

20 Q. Did you do the presentation?

21 A. No.

22 Q. Okay.

23 A. Phil did it.

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1 Q. I'm sorry?

2 A. Phil Trowbridge.

3 Q. Phil Trowbridge did it.

4 Under "Next Steps," it says, "Phil
5 Trowbridge will work with Fred Short on an eelgrass
6 water clarity model." Do you recall being tasked
7 with being -- developing an eelgrass water clarity
8 model?

9 A. I remember talking about it at the
10 meeting.

11 Q. Do you recall working on an eelgrass
12 water clarity model?

13 A. No. They never came up with any money
14 to support that.

15 Q. Okay. So you didn't do anything,
16 because it -- so you're saying you didn't do anything
17 on --

18 A. I wasn't involved in it, no.

19 Q. Okay. So the next statement says, "Phil
20 Trowbridge, Jim Latimer, and Fred Short will complete
21 the analysis related to water clarity and eelgrass.
22 The biggest issue is clarifying whether nitrogen is
23 responsible for water clarity changes in Great Bay."

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1 Again, you're saying that following
2 this meeting, you didn't participate in that effort?

3 A. No. I gave them some information that I
4 had.

5 Q. You gave them some information.
6 Do you recall what kind of information
7 you gave them?

8 A. Literature.

9 Q. When you say "literature" --

10 A. That's the --

11 Q. I'm sorry.

12 A. Not -- stuff published by other people.

13 Q. Okay. Not Great Bay-specific?

14 A. Published literature.

15 No.

16 Q. No. Okay.

17 A. It's a general issue.

18 Q. Gotcha.

19 Let's go on the next meeting. It's
20 February 20, 2007. And I'm on page 2, where Phil
21 Trowbridge is apparently giving a presentation on
22 light availability.

23 A. Tell me again where you are. The

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1 next --

2 Q. Yeah, the next one, page 2 of it.
3 February 20. Do you see right here, top right --

4 A. Could you read that?

5 Q. Yeah, I'll read it. It says, "Phil
6 Trowbridge gave a presentation on light availability
7 for eelgrass in Great Bay. In summary, the data
8 analysis show that measured light attenuation factors
9 accurately predicted where eelgrass was present and
10 absent. However, there were no valid relationships
11 between light attenuation factors and water quality
12 parameters, such as chlorophyll-a and suspended
13 solids. Approximately half the variability in the
14 light attenuation factor was explained by changes in
15 salinity, which is inversely proportional to colored
16 dissolved organic matter."

17 Do you recall Phil Trowbridge doing a
18 presentation, saying, "I can't develop a
19 relationship showing" --

20 A. Yes, I think I do.

21 Q. Okay. And did you agree with the
22 results?

23 A. No.

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1 Q. Can you tell us why not?

2 A. Because it's more complicated than what
3 he was trying to do.

4 Q. How so?

5 A. Well, because in Great Bay, a lot of the
6 issue is macroalgal problems and not chlorophyll. So
7 in not all instances, not all parts of Great Bay
8 do -- does chlorophyll relate to light attenuation.
9 So it's -- and it took -- this is back
10 in, whatever it was, 2007.

11 Q. '7.

12 A. Yeah. It took several years to educate
13 the community as to how the system actually
14 functioned. And as you recall, I've talked to you
15 and written to you about it in the past.

16 Q. And in terms of how the system -- this
17 system actually --

18 A. The Great Bay doesn't function the same
19 as Little Bay and the Piscataqua River. They're
20 quite different systems, that the light reaching the
21 eelgrass is -- is -- and the nitrogen problem in
22 Great Bay is primarily seaweed/macroalgal-related.

23 Q. Primarily, not --

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1 A. Not exclusively.

2 Q. I'm sorry. Could you slowly restate
3 that? That --

4 A. That the nitrogen problem in Great Bay
5 is not primarily -- is primarily connected to
6 macroalgal or seaweed growth.

7 Q. Okay. And that's --

8 A. Not exclusively, but --

9 Q. That's consistent with statements that
10 you've made in other forms here; correct?

11 A. Yes.

12 Q. Okay.

13 A. But the group here didn't have the sense
14 of that at this point.

15 Q. And the next statement, where they talk
16 about -- I'm going down a couple bullets down --
17 "Compile the coefficients of light attenuation
18 factors for TSS, chlorophyll-a, colored dissolved
19 organic matter from other systems. Use these
20 relationships to predict light attenuation for
21 Great Bay based on measured water quality."

22 That was a recommendation. Do you know
23 if that was carried out?

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A. I don't specifically remember if it was. I know there were obviously desperately trying to figure out how to understand the data in Great Bay at the time. So we -- we -- someone recommended that we look at other systems, again because it's not a unique problem.

Q. Okay. I'd like you to look at the next TAC meeting minute. That's December 7, 2007.

MR. HALL: A day of infamy, I might
add.

MS. VAN OOT: Not in 2007.

MR. HALL: Not in 2007 --

MS. VAN OOT: But --

MR. HALL: -- but of historic interest.

MS. VAN OOT: To some.

Q. Were you present at this meeting,
Dr. Short?

A. I seem to be on the list, yeah.

Q. Okay. There's a discussion on page 1 here about Dr. Ru Morrison giving a presentation on the relationship between light attenuation and water quality measured by the Great Bay buoy in 2007.

Do you know what that's all about, what

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1 research Dr. Morrison did?

2 A. Yes.

3 Q. Okay. What research did he do?

4 A. He deployed a monitoring buoy in the bay
5 that measured all these parameters, and then analyzed
6 them.

7 Q. Okay. Do you recall what the purpose of
8 that was?

9 A. To try and understand what's going on
10 with water clarity in the bay and -- well, water
11 quality in general, I assume.

12 Q. Was it like how much the water clarity
13 was affected by different components? Was that part
14 of the analysis?

15 A. No. It was really what -- well, I don't
16 know what the analysis was. The buoy was measuring
17 all these things, and he was looking at
18 interrelationships between them.

19 Q. Okay. Well, I'll read the next
20 sentence. It says, "In summary, the data analysis
21 showed light attenuation is largely controlled by
22 turbidity and colored dissolved organic matter.
23 Chlorophyll-a only accounts for 8 percent of the

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1 overall light attenuation. Turbidity in the estuary
2 can be predicted from stream flow and wind speed."

3 Did you have any basis for disagreeing
4 with these conclusions from Dr. Morrison's research?

5 A. Yes.

6 Q. And what's your basis for disagreeing?

7 A. I don't think I need to go into it,
8 actually. Without going back and reviewing the data
9 again, I'm not prepared to present that.

10 Q. Did Dr. Morrison -- was his analysis not
11 competently done?

12 A. I -- I don't remember what my objections
13 were to it, but I know I have some concerns about it.

14 Q. Let me show you what we'll mark as
15 Exhibit 25, and this is Dr. Morrison's report.

16 *(Short Exhibit 25 is marked for*
17 *identification.)*

18 Q. And let me see if that refreshes your
19 recollection as to --

20 MS. VAN OOT: Wait. This is a report
21 that was issued a year after --

22 MR. HALL: Yes. This was the report of
23 Dr. --

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1 MS. VAN OOT: -- a year after the
2 meeting at which the presentation was given?

3 MR. HALL: Yes.

4 MS. VAN OOT: Just for the record.

5 MR. HALL: It was presenting the
6 results of the research, and this is the
7 report that comes out.

8 MS. VAN OOT: Okay.

9 BY MR. HALL:

10 Q. With regard to that report, Dr. Short,
11 do you recall submitting comments to Dr. Morrison
12 explaining that there were errors or anomalies in his
13 analysis that needed to be corrected?

14 A. I don't remember.

15 Q. Do you recall having any discussions
16 with Phil Trowbridge or anyone else from the State of
17 New Hampshire, telling them there were areas or
18 anomalies or discrepancies in that report that needed
19 to be corrected?

20 A. I do believe I had some discussions
21 saying I didn't think it characterized the situation
22 correctly.

23 Q. Did you have actually any -- any actual

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1 data that you collected, like, that showed that
2 Dr. Morrison's findings or analyses were incorrect,
3 that you presented to the State?

4 A. No, I don't believe so.

5 Q. Dr. Morrison calculated that the
6 chlorophyll-a level -- this is in Great Bay -- is
7 only 8 percent of what affects light transmission in
8 the bay.

9 MS. VAN OOT: Are you representing
10 that's what's in the report or that's what's
11 in the --

12 MR. HALL: It's right on page 1 of this
13 analysis. It's also what's in the report.
14 It's -- what's in the report is specified
15 that --

16 MS. VAN OOT: Okay. That was my
17 question. Does the 8 percent come from his
18 presentation in December of 2007?

19 MR. HALL: And is reflected in the
20 report.

21 MS. VAN OOT: Okay. Can you just tell
22 me where, so I can --

23 A. Where is it in the report?

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1 Q. It's in the graphs. About the
2 chlorophyll-a percentage.

3 A. Well, this one says 12 percent
4 chlorophyll.

5 MS. VAN OOT: Yeah.

6 So is it -- are you asking him --

7 MR. HALL: All right. Let's go with
8 12 percent, then, for the time being.

9 Q. Dr. Short, do you disagree that the
10 chlorophyll-a component was properly calculated to be
11 only 12 percent of what affects light transmission in
12 Great Bay?

13 MS. VAN OOT: Is that what the report
14 says? Yes or no.

15 Q. Assuming that's what the report says.

16 MS. VAN OOT: Assuming. You don't have
17 to assume what the report says.

18 A. Yeah, I'd have to read through it to
19 find that.

20 Q. On page 3 of this analysis -- I'm sorry.
21 Page 3 of the meeting minutes, right in
22 the middle --

23 MS. VAN OOT: On December 7th?

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1 MR. HALL: On December 7th.

2 Q. -- there's a statement.

3 And this is, I guess, after a
4 presentation was done by Paul Currier and some
5 others on various options to generate criteria for
6 Great Bay. It says, "Do not spend time researching
7 other estuaries for Option 5." It means reference
8 approach for other estuaries within the region.
9 "Reference estuaries are too different from
10 Great Bay to be useful."

11 Do you know who made that statement and
12 what it's based on?

13 MS. VAN OOT: Two questions, but go
14 ahead and answer if you know.

15 A. I -- I do not know who made that. Was
16 this the presentation by Paul that we're under?

17 Q. No. This is a group discussion after
18 looking at various options to try to come up with a
19 way to calculate a nitrogen criteria for Great Bay.
20 I mean --

21 MS. VAN OOT: It refers back to option
22 5 on page 2.

23 A. Yeah, I don't know who made that.

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1 Q. I'm going to show you the -- let's go to
2 the next page, on June 10.

3 Now we've marked that as Exhibit 25.

4 Looking at No. 4 under -- on page 2,
5 where it says, "Phil Trowbridge now made a
6 presentation on the relationship between light
7 attenuation and water quality parameters using
8 aggregate statistics from different segments of the
9 estuary," and they attach the presentation. I'll
10 show you the graph in a moment.

11 MS. VAN OOT: The presentation is not
12 attached in the exhibit.

13 MR. HALL: No. I said I'll show him
14 the graph that's referenced in a moment.

15 MS. VAN OOT: Okay.

16 Q. It says, "General comments on the
17 presentation was that causation needs to be proved
18 better and that lumping data from all seasons and
19 tides may mask cause and effect."

20 Do you know what new presentation Phil
21 Trowbridge was doing at that time?

22 MS. VAN OOT: What what?

23 MR. HALL: What type of presentation

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1 Phil Trowbridge was doing at that time.

2 A. No. You should ask him.

3 Q. Do you recall Mr. Trowbridge presenting
4 this graph?

5 MR. HALL: Let's mark this as Exhibit
6 26.

7 *(Short Exhibit 26 is marked for*
8 *identification.)*

9 MS. VAN OOT: Do you remember this one?

10 A. Yeah, I remember a graph like this.

11 Q. Did you ever inform DES that that graph
12 demonstrates a cause-and-effect relationship between
13 nitrogen and light extinction?

14 A. Well, that it's the definition of a
15 regression.

16 Q. The definition of regression is that it
17 demonstrates cause and effect?

18 A. No. That it -- it says that attenuation
19 coefficient is a function of nitrogen.

20 Q. What I asked was, do you recall ever
21 advising New Hampshire DES that that graph in fact
22 does demonstrate a cause-and-effect analysis of light
23 attenuation due to nitrogen?

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1 A. I don't remember ever using those
2 specific words. Well, I don't even remember talking
3 to the DES about it, because I don't know who you're
4 referring to at DES.

5 Q. Phil Trowbridge.

6 So you don't recall having any kind of
7 discussion like that with Phil Trowbridge?

8 A. I don't recall, no.

9 But the mathematical interpretation of
10 this is that attenuation coefficient is a function
11 of total nitrogen.

12 Q. But didn't Dr. Morrison just show
13 that --

14 A. That was different data, I believe.

15 Q. No, no.

16 A. Well, I think it was.

17 Q. Do you know if it was different data?

18 A. No. Do you?

19 Q. Yes, actually. But I'm not testifying.

20 A. That's true.

21 No, I don't know what the source of the
22 data is. It says many different -- many fewer data
23 points than within the other one. So it's -- it

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1 doesn't look to me as if it's the same data.

2 Q. Did you ever inform Mr. Trowbridge that
3 it's appropriate to plot data from --

4 A. In fact, I know that it's different
5 data, because his data was all from one point in the
6 estuary, and this is data from the entire estuary.
7 So it is in fact different data.

8 Q. There's some different data.
9 Did you ever tell Mr. Trowbridge that
10 it was appropriate to plot light extinction from
11 different parts of the estuary versus nitrogen as
12 the complete explanation for what's affecting light
13 extinction in those various sections of the estuary?

14 MS. VAN OOT: The question is did you
15 ever tell him that.

16 A. No.

17 Q. There's a statement in the November 17,
18 2008, meeting minutes regarding that correlation --

19 MS. VAN OOT: Page?

20 MR. HALL: It's on page 3.

21 Q. -- and it's a related statement that has
22 to do with nitrogen and turbidity. It says, "The
23 relationship between nitrogen and turbidity is a

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1 correlation."

2 A. Which one is this?

3 MS. VAN OOT: Wait. What page are you
4 on?

5 MR. HALL: I'm on page 3. Page 3 of
6 the -- oh, the very last one.

7 We're switching to November 17. Sorry.

8 MS. VAN OOT: Okay.

9 MR. HALL: Last one.

10 MS. VAN OOT: Give us a minute. We're
11 slow.

12 Page 3?

13 MR. HALL: Yeah. It says, "The
14 relationship" -- the demonstrated relationship
15 between nitrogen and turbidity.

16 MS. VAN OOT: What's the context of
17 this?

18 MR. HALL: It says that -- there's a
19 relationship just like that. There's a stack
20 of them. You may have seen them before.

21 Q. It says, "The relationship between
22 nitrogen and turbidity is a correlation. Causation
23 has not been proven."

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1 Do you --

2 A. That's consistent.

3 Q. Hmm?

4 A. I'm -- what's your question?

5 Q. I'm sorry.

6 Were you there when that statement was
7 made, that this has not proven causation?

8 A. I don't know. It says I was at the
9 meeting. If it was made in the general discussion at
10 the meeting, I probably was there.

11 Q. Okay. Do you know if correlations prove
12 causation?

13 MS. VAN OOT: As a general principle?

14 MR. HALL: Yeah.

15 A. No, they don't.

16 Q. No, they do not?

17 A. No, they do not.

18 Q. I have no further questions on those
19 charts. And now let's just move to the 2009 criteria
20 report.

21 MR. HALL: This is Exhibit 27.

22 *(Short Exhibit 27 is marked for*
23 *identification.)*

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1 Q. Dr. Short, were you involved in the
2 development of the 2009 numeric nutrient criteria?

3 A. No.

4 Q. Did you attend any meetings of the
5 Jackson Laboratory with CLF and DES to discuss the
6 establishment of these numeric criteria?

7 A. With who, specifically?

8 Q. With CLF and DES.

9 A. They're not people.

10 Q. No. People -- members of CLF.

11 MS. VAN OOT: As Mitt Romney would say.

12 Q. Members of CLF.

13 A. Unless you tell me the specific people
14 who were there, I don't -- you know, I attend
15 meetings with a lot of people at a lot of times, and
16 the two of them may have been there, or there may
17 have been a meeting. I don't know.

18 Q. Are you familiar with this 2009 numeric
19 nutrient criteria document?

20 A. Yes.

21 Q. You're familiar with -- you didn't
22 provide any input on it?

23 A. I didn't say that.

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1 Q. Oh, okay. I thought you asked you if
2 you were involved in the development of it.

3 A. Of the criteria.

4 Q. Yeah.

5 A. This is not the criteria. This is an
6 explanation of the criteria.

7 Q. Of the criteria.

8 A. I was involved in the development -- in
9 this -- I reviewed this document.

10 Q. Ah. Okay. That's --

11 A. That's -- it's quite different than
12 developing the criteria.

13 Q. Well, what was the purpose of that
14 document?

15 A. To describe the method by which they
16 developed the nutrient criteria.

17 Q. This document assisted in the
18 development of a number of new water quality metrics;
19 is that correct?

20 A. I really don't remember.

21 Q. Did this document develop a specific
22 transparency level that should be achieved to protect
23 eelgrass?

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1 MS. VAN OOT: Do you want him to
2 review -- I mean --

3 A. I would have to reread it to find that
4 out, to figure that out. I review a lot of things.
5 This is -- you know, this is all volunteer work.
6 It's, you know, not something I keep in memory.

7 MS. VAN OOT: Do you want to direct his
8 attention to a page number?

9 MR. HALL: Yeah. I thought he was more
10 familiar with the document than maybe what he
11 is.

12 Q. If you can go to page 68.

13 MS. VAN OOT: That wasn't a question,
14 was it? It was just your comment?

15 MR. HALL: Hmm?

16 MS. VAN OOT: That wasn't a question?

17 MR. HALL: No, no, that wasn't a
18 question. That was simply an observation.

19 MS. VAN OOT: It was a simple comment.

20 Q. If you would go to page 68, Dr. Short,
21 the page entitled "Summary Proposed Nutrient
22 Criteria."

23 A. Yes.

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1 Q. Okay. Do you remember the -- do you
2 recall that the purpose of this document was to
3 develop numeric nutrient criteria?

4 A. It was to explain how different criteria
5 were developed. This document did not develop them.
6 That's different.

7 Q. Do you want to explain the difference,
8 or could you?

9 A. I could.

10 Q. Please.

11 A. But I don't think I really need to, do
12 I? You're talking about that this document itself
13 created the criteria --

14 Q. Oh.

15 A. -- and it did not.

16 Q. Was this the technical support document
17 for the development of the --

18 A. Yes.

19 Q. -- nutrient criteria?

20 A. That's more correct. That would be
21 correct.

22 Q. Okay. And did this document recommend a
23 specific transparency level that was necessary for

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1 eelgrass protection in Great Bay and other tidal
2 rivers?

3 A. I suspect it did.

4 Q. Okay. Do you know where -- what the
5 basis or the derivation of the transparency target
6 was?

7 A. Yes.

8 Q. And what was it?

9 A. It was a calculation that Phil
10 Trowbridge did.

11 Q. Okay. Was the transparency level based
12 on the degree of light considered necessary to
13 protect eelgrass in Chesapeake Bay?

14 MS. VAN OOT: If you know.

15 A. You have to ask Phil.

16 Q. You don't recall?

17 A. No.

18 Q. Okay. Do you know if anybody looked at
19 the transparency levels in Great Bay that occurred
20 when healthy eelgrass populations were present in the
21 bay?

22 A. Do you mean is there any historic data?
23 Is that what you're asking?

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1 Q. Well, in developing this document.

2 A. Oh, I don't know.

3 Q. Okay.

4 A. How can I know what everybody did?

5 Q. Now, this document -- this document also
6 developed, say, a nitrogen level associated with the
7 transparency level; is that correct?

8 A. I think one is derived from the other.

9 Q. Okay. And is there an assumption built
10 into that that the nitrogen is growing chlorophyll-a
11 and that's what's causing the transparency level to
12 change?

13 MS. VAN OOT: If you know.

14 Q. Would you know?

15 A. I don't know.

16 Q. Do you know if anybody checked the
17 nitrogen levels in Great Bay that were present when
18 healthy eelgrass populations existed in Great Bay
19 before recommending these specific nitrogen targets?

20 A. I don't know. That's asking me what
21 other people did.

22 Q. Oh, no. I'm just asking whether you
23 know. You may or may not.

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1 Do you know if the development of this
2 nitrogen development criteria document utilized
3 methods that TAC members said do not show cause and
4 effect?

5 A. Say it again, please.

6 Q. Do you know if the development of -- the
7 derivation of the nitrogen criteria from this
8 document relied on methodologies that the TAC
9 committee indicated do not show cause and effect?

10 MS. VAN OOT: Objection to the form of
11 the question.

12 Q. If you can answer that.

13 A. I don't know.

14 Q. Do you know whether or not DES, in
15 developing the 0.3 total nitrogen standard, accounted
16 for other factors that influenced light extinction in
17 different locations in the estuary?

18 MS. VAN OOT: Objection to what DES
19 understood.

20 A. I don't know.

21 Q. Dr. Short, do you know whether or not --
22 and I'm showing you again Exhibit 26 -- do you know
23 if Exhibit 26 was the basis upon which the 0.3

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1 nitrogen standard was developed?

2 MS. VAN OOT: Objection to the form.

3 You can answer.

4 A. I don't know. I mean, it's -- the
5 indications on there are that that's what that
6 implies. But . . .

7 Q. I think I covered this with you earlier,
8 but I'll just ask it again.

9 With regard to that 0.3 total nitrogen
10 number that's in the table on page 68 of this
11 report -- can you find that table on page 68?

12 A. (Complies)

13 Q. Okay.

14 -- did you advise DES that it was
15 appropriate to apply that number in the tidal
16 rivers? And when I mean tidal rivers, I mean the
17 Lamprey, the Squamscott, the Oyster River.

18 A. What was the number again?

19 Q. 0.3 milligrams per liter total nitrogen.

20 A. No, I did not advise them.

21 Q. Dr. Short, were you involved at all in
22 the updated impairment listing document that got
23 issued by DES in August of 2009?

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1 Let me just --

2 MS. VAN OOT: Is there a page number?

3 MR. HALL: It's not in that one. I

4 just want to ask --

5 Q. Let me just show you this document and
6 ask you whether or not you were involved in that --
7 in the development of that document.

8 A. Was this reviewed by the TAC?

9 Q. I am not certain.

10 A. I don't -- I don't know. I don't
11 recognize it.

12 Q. You don't recall seeing that one?

13 A. There are a lot of versions of a lot of
14 reports.

15 Q. Okay. Do you have any knowledge as to
16 whether or not DES utilized the numeric values
17 contained in the table on page 68 -- I'm going to
18 just go back to that one -- whether or not they
19 utilized those numeric values to go back and assess
20 different areas of the bay as impaired for
21 transparency or impaired for nitrogen or impaired for
22 dissolved oxygen?

23 MS. VAN OOT: Do you know what DES did?

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1 A. Don't know what DES did.

2 Q. You don't know what DES did?

3 MR. HALL: Okay. I don't have any
4 further questions. Thank you, sir.

5 MR. LUCIC: I have no questions at this
6 time.

7 MR. SERELL: No questions.

8 MS. VAN OOT: Please send the
9 transcript to me in electronic form, and I'll
10 make sure it gets to Professor Short and have
11 him execute it with the usual instructions,
12 which you'll find fascinating, and get it back
13 to everybody.

14 MR. HALL: Great.

15 MS. VAN OOT: Thank you.

16 *(Witness excused and deposition*
17 *concluded at 4:49 p.m.)*

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WITNESS CERTIFICATION and ERRATA SHEET

In accordance with the rules of procedure governing depositions, you are entitled to read and correct your deposition transcript. Please read your deposition and on this errata sheet make any necessary corrections or changes, either in form or substance. Identify those corrections/changes by page and line number, stating the change and the reason. Please do not mark the actual transcript. **(Make extra copies of this sheet if you need to indicate more changes or corrections than will fit on this one page.)** When completed, date and sign the errata sheet and have your signature notarized.

| <u>Page/Line</u> | <u>Correction</u> | <u>Reason</u> |
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Date: _____

FREDERICK T. SHORT

Subscribed and sworn to before me this _____
day of _____, 20____.

Notary Public/Justice of the Peace

C E R T I F I C A T E

I, Deanna J. Dean, a New Hampshire Licensed Court Reporter, Registered Diplomat Reporter, and Certified Realtime Reporter, do hereby certify that the foregoing, to the best of my knowledge, skill and ability, is a true and accurate transcript of my computer-aided electronic stenographic notes of the deposition of FREDERICK T. SHORT, who was duly sworn, taken at the place and under the circumstances present on the date hereinbefore set forth.

I further certify that I am neither attorney or counsel for, nor related to or employed by any of the parties to the action in which this deposition was taken, and further that I am not a relative or employee of any attorney or counsel employed in this case, nor am I financially interested in this action.

Deanna J. Dean, RDR, CRR

NH LCR No. 87 (RSA 310-A)

Signed this ____ day of _____, 2012